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Original Papers.

EVENING BATHING IN VICTORIA PARK.

BY FRANCIS GEORGE HEATH.

NEARLY four years ago, namely, in the autumn of 1871, I called public attention by means of several letters which appeared in the *Daily News* under the heading of 'East End Bathing and the Cholera,' to the dangerously unwholesome condition of the water in the two bathing lakes at the eastern side of Victoria Park. The larger of these two lakes is about 300 yards long, and some thirty or forty yards wide. Strictly speaking, indeed, this is the only lake in the park originally set apart for bathing, although for many years bathing has also been permitted in what is called the 'old lake,' a piece of water to the east of, and almost immediately contiguous to, the bathing lake properly so called. About two or three years before the period to which I have referred above, a considerable enlargement of the easternmost lake had been effected. Previous to this enlargement it was only half its present size. But the increase in its area was by no means commensurate with the requirements of the immense numbers of people who flocked to it in the summer season; and, although bathing was only allowed during four hours each morning, namely, from four to eight o'clock, the water, owing to the fact that there was no effectual provision made for its inlet and outlet, soon got into a most foul and filthy state.

This, in fact, was the state of matters towards the close of the bathing season of 1871, as already indicated. At that time we were threatened by the prospect of a visit from the cholera, and I pointed out that there was a double danger in the existence of this foul piece of water; first, the general danger to the health of the district, and secondly, the peculiar danger to which thousands of the bathers—more especially, perhaps, young boys—would be exposed by involuntarily swallowing, in the act of splashing about, small quantities of the foul water.

It must be borne in mind that this was by no means a small question. The Victoria Park lake was the only good and safe piece of bathing water in the midst of a district containing a densely packed population of not less than a million souls; and it was chiefly the industrial classes who from far and near flocked 'in their thousands' to enjoy a 'dip' on the hot summer mornings during each of the four hours allowed by the park regulations for bathing. So intense was the passion for ablution on the part of these brawny sons of toil that the foul state of the water was totally disregarded, the number of bathers each morning being regulated solely by the state of the thermometer. The danger therefore became worse season after season. During the winter the water, it is true, usually became clearer, and apparently purer; but on the return of each succeeding summer the evil was intensified. The explanation of this is very simple. The bathing lake was constructed so that it shelved all round to its centre, where it had its greatest depth—six feet. It was supplied with fresh water at its eastern end by means of a small iron pipe placed above the water level, and at its western end it had an outlet through some small pipes laid level with the surface of the lake. It is obvious, therefore, that it would have taken a considerable time to change the entire body of water in the lake, even had the process of changing been complete and continuous. But this was not the case. Practically the fresh water flowed in at one end and out at the other, leaving all impurities, animal and vegetable matter, to settle into the bed of the lake and there accumulate, to be periodically stirred up by the bathers on the recurrence of each bathing season.

Notwithstanding this condition of the water, it was a long time before the matter was looked into by the proper authorities. I communicated with the Commissioners of Works on the subject towards the end of September, 1871, and obtained a promise that it should be taken into consideration. But the whole of another bathing season went by without anything being done to remedy the evils I had pointed out, although the matter was taken up warmly by Dr. Tripe, the Hackney medical officer, who, I believe, proposed to take legal proceedings against the then First Commissioner of Works, Mr. Ayrton, to compel him to cleanse the lakes. At length, however, about the month of November, 1872, the necessary work was taken in hand, and the thick bed of foul deposit which had to be taken away proved the extent of the evil which the authorities had been so slow to remove.

About this time improvements in the method of filling and emptying the large bathing lake were talked of, so that provision might be made for preventing the fouling of the water which would otherwise be inevitably caused in a short time by the multitudes of bathers who used it; but nothing was then done, and it was not long before the water was again brought into an unwholesome condition.

In January, 1873, the Metropolitan Bathing Association was established in order to promote the extension of the bathing accommodation in the metropolis; and shortly afterwards a deputation from the association sought an interview with Mr. Ayrton in order to obtain his consent to a proposal that the large bathing lake in Victoria Park should be open for bathing for one hour each week evening during the summer months. The request, however, was refused, although Mr. Ayrton entered with some interest into the subject and told the deputation that, about the year 1870, a lady named Brown, residing in the West-end of London, had expressed a desire to be allowed to provide at her own expense the means for affording bathing accommodation in all the London parks. At this lady's request some very elaborate plans were prepared for laying out and enclosing bathing-waters, so as to hide them completely from the view of the other frequenters of the parks. The plans were shown to the Queen, who was much pleased with them; and they were, in fact, just about to be carried into effect when Mrs. Brown died, and the contract for the work not having been signed by her, there was no one who was empowered to give effect to her wishes. Mr. Ayrton hinted to the deputation that some other benevolent persons might, perhaps, be willing to carry out Mrs. Brown's plans, and he even suggested that Parliament might be induced to take the question in hand and provide the necessary funds. Nothing, however, came of his suggestions. But last year, thanks to the energy and persistence of Mr. J. H. Heeps and some other members of the Metropolitan Bathing Association, the permission of the present First Commissioner of Works, Lord Henry Lennox, was obtained for an hour's evening

bathing in Victoria Park, 'as an experiment,' during week days, from July 9 to September 30.

A more extraordinary sight of the kind had, perhaps, never been seen than that presented at the lake on the evening of July 9. The news had travelled far over the East of London that bathing would be permitted on that evening from eight to nine o'clock. A number of gentlemen interested in the trial of the 'experiment' had assembled to witness the proceedings; and after a short public meeting had been held to inaugurate the event, they adjourned to the banks of the lake. There every inch of ground was covered by a vast crowd of intending bathers. These, anticipating the concession which was about to take effect, had already stripped, and in a few minutes it is not too much to say that the water could scarcely be seen for the great multitude of persons who flocked into it. 'The great unwashed' had come in tens of thousands—in numbers, in fact, far too great to find room to bathe in the short interval of time allowed—with anything like comfort. The spectators of the scene alone numbered at one time little short, it was estimated, of 15,000 persons. So far as hundreds of the bathers were concerned it would have been somewhat difficult to hazard a guess as to the period when they had previously indulged in the luxury of a bath. But judging from their sombre hues the period must have been very remote. In fact, it is probable that the greater number of these evening bathers were those who had previously found it impossible to avail themselves of the privilege of open-air bathing in the morning, and a good many of them doubtless had not had a bath for years. These of course freely indulged in the use of soap, and when eight o'clock came and the crowds were ordered out of the lake it is easy to imagine in what condition the water must have been. Similar scenes to that presented on the 'opening night' were observable throughout the greater part of last summer—the numbers of evening bathers rising in proportion to the rise in the thermometer. Of course the water of the lake, pent within such comparatively narrow limits, and not removed in a proper manner, soon got into a filthy condition. It became so bad, in fact, that hundreds of the better class of bathers gave up bathing in the park; yet hosts of the industrial poor came nightly to indulge in what was still to them a luxury, although a luxury of a very questionable kind.

During the continuance of this evening bathing last summer I believe no complaint was made of the conduct of the bathers. The lake is concealed from view on all sides except one by embankments planted with shrubbery; and on its open side the Metropolitan Bathing Association erected a large screen, so as to hide the bathers from the other visitors to the park, and thus secure the necessary privacy. Lord Henry Lennox took a good deal of personal interest in this subject. He went to the park so that he might see for himself 'the effect of the concession made to the advocates of evening bathing,' and he expressed himself much pleased with the result.

On Friday, June 11, a deputation from the Metropolitan Bathing Association, headed by Mr. John Holms, M.P. for Hackney, again went to the First Commissioner of Works to ask him to continue the privilege of evening bathing in Victoria Park during the present summer. Lord Henry Lennox readily gave his consent, stating at the same time that the park superintendent had reported to him, with reference to the evening bathing last year, that everything had gone on favourably, there being no disorder, but the utmost willingness on the part of the bathers to obey the rules laid down. Touching the number of persons who used the lake at one time, the park superintendent had also reported that at one period of a particular evening the lake was full, but 'there might have been room to have squeezed in one man and two boys.' The twenty-first of last month was fixed for the recommencement of evening bathing, and, accordingly, on that evening a very large number of persons availed themselves of the privilege. The number would have been greater but for the coldness of the weather. Should we, however, get a continuance of hot weather during the rest of the summer, the scenes of last season will be repeated, and the consequence must be that the water will again be brought into a foul and unwholesome condition.

It is obvious, therefore, that what is needed is a very considerable extension of the bathing lake. The First Commissioner of Works has promised that this shall be done, and it is his intention, I believe, to have the necessary works commenced this year. It is proposed to widen the lake, but it has not yet, I think, been decided to what extent this shall be done. There ought to be, however, not only a widening of this particular piece of ornamental water, but a very considerable lengthening of it. Indeed, if it were twelve times its present size it would scarcely be large enough for the requirements of the vast population of East London. The question is one of sufficient importance to engage the attention of Parliament, and the public money ought not to be stinted in the matter. Much as I commend the excellent movement which has resulted in securing a concession from the present First Commissioner that has been persistently refused by his predecessors during a number of years, I am bound to express the opinion that the use day after day of a comparatively small piece of water by such vast numbers of people is likely to do more harm than good. But that is nevertheless not an argument, as some persons have contended, against the concession of Lord Henry Lennox, but an argument, and a very strong one, in favour of a great extension of the privilege, and of a great extension too of the means necessary to make that privilege enjoyable and healthful.

It seems to me that the accommodation for bathers in the East of London should not be limited to that which it may be found possible to provide in Victoria Park. In every practicable way the industrial classes should be encouraged in the habit of open-air bathing. It is quite unnecessary for me in this place to enlarge upon the healthful and admirable effects of such a practice; and it will, I think, be admitted that there are no parts of the metropolis in which the existence of good bathing accommodation is more urgently needed than in the Eastern districts. The extraordinary use which has been made for bathing purposes of the comparatively small ornamental lake on the eastern side of Victoria Park shows that a great public want has been met by very inadequate means, and demonstrates the necessity for largely extending those means in the interest of the public health.

CONDITIONS OF HEALTH IN REGARD OF HUMAN DWELLINGS AND OTHERWISE.

BY HENRY MACCORMAC, M.D.

THE question of health is one of excessive moment. We live or we die, live well or miserably, live our full term or perish prematurely, accordingly as we shall wisely or otherwise determine. Half the human race perishes in infancy of, for the most part, preventable causes of death; and of those who reach adult life the great majority, it may be truly said, are cut off before their time. They eat and drink too much, else they eat and drink too little, what they do take is unsuitable of its kind, or, if suitable, owing to various disturbing influences, they are unable to assimilate it properly. Like remarks, *mutatis mutandis*, may be passed, in regard of habiliments, lodging, warmth and other conditions more or less essential to man's life and health.

But irrespective of these matters, our habits have a vast deal to say to our vital condition; how much, no one who has not looked into the question, can well imagine. A little, yes a very little, divergence from the *linea recta* will in the long run conduct irreversibly to issues the most disastrous. If a vigorous man, a healthy child, were, within a few hours, to become pallid, feeble, with functional derangement and organic decay, in short, moribund, we should be justly surprised, and, if interested, hasten to inquire the cause. But when such results occur slowly we term it, forsooth, chronic disease, we call it hereditary, or, if of a religious turn, we say it is a stroke of providence; and as the French phrase it, *tout est dit*. But all, in reality, is not said, and if we only look at the cases from a sufficient elevation, we may perchance trace the course of events with the same facility and definiteness as we should the current of some river in any well-constructed map. I only wish to add to the foregoing general considerations that moral causes must also be taken into account. What, moral causes? Yes, indeed, and I shall say that moral causes exercise a most determinate influence as respects the occasions of health and disease, and in my opinion have been vastly too much overlooked, save in a most vague and perfunctory fashion, in our inquiries.

The leading matters in regard of health, as, pure air, water, food, light, warmth, and the rest, may be summed up under fewer heads and in briefer fashion than most persons would be inclined to imagine. The difficulty, in truth, is to induce people to take them effectively to heart and make them an ingredient of their daily life and action. There is a vague general idea that air, pure air, is a useful enough sort of thing; but why it is so, or how, few know, and fewer still inquire. It is not so very long ago since it was thought that animal warmth was a direct product of nervous action. How many in a thousand of the educated classes are aware how animal warmth is produced? How many even—but I must not put indiscreet questions. The fact is, that not one person in ten thousand has any, were it even the most vague idea, how animal warmth originates; and yet it is a process that has the very closest connection with wellbeing and disease, the presence or the absence not merely of ordinary health, but of the most destructive malady that now affects our species. Animal warmth, then, is created and maintained by the combustion within the organism of the effete carbonaceous waste; the difference in capacity for latent caloric between carbonic acid—carbonic anhydride, as it as been recently termed—and oxygen in disfavour of the former, yielding the surplus which we term animal heat. Now, if the air have already been relieved of its disposable oxygen, it will no longer fitly oxidise the effete carbon. This being insufficiently excreted the inevitable result is joint functional and organic disease. Those who run may read, and if I have not yielded adequate motive for the respiration of air not pre-breathed and not impure, I know of nothing in the wide range of words or things calculated to do so.

A number of years ago I contemplated a translation, with notes and comments, of the *Airs, and Waters, and Places of Hippocrates*, but I refrained, knowing how much in these days we should have to differ from him. Nevertheless, the subject is as rife for comment as ever, but having said my say in respect of air, I shall now proceed to observe something about water. All the drinking water to which we have access is nature distilled; indeed this is the case with all fresh waters, but they are very far indeed from reaching us in a pure condition. At least, our drinking waters are often terribly deteriorated and impaired. Our drinking water, I allege, ought to be simply as pure as it is furnished by the hands of nature. Water cannot be better than this, and assuredly ought not to be worse. How, then, is this so desirable result to be compassed? Most readily, I reply. It is only needful to filter rain-water, once or oftener, thoroughly. Rain-water also needs to be well filtered or even boiled in addition. As a general rule, pump or well-water, even at its best, is undesirable. As for tainted well-water, water loaded with impurities, living or dead, it is an abomination. Water absolutely pure and untainted alone meets man's requirements, and ought to be alone supplied. Every requisite means should be resorted to calculated to render it so. How any one can recommend hard water is what I do not understand. Soft water is better for cooking, drinking, and washing alike. Mineral ingredients—I speak of ordinary drinking waters—are therein quite misplaced. Any minerals, so far as we require minerals, abound sufficiently in our solid food. Simple boiling, where we cannot both boil and filter, is a great preservative, destroys most detrimental ingredients, renders parasites harmless. And I cannot sufficiently admire the Chinese who boil all their drinking water, which water they otherwise consume in the form of tea. Indeed, any high toasted vegetable ingredient—tea, coffee, torrified bread, and the like—renders boiled and filtered water agreeable to the palate. Otherwise water, or indeed any drink, ought not to be taken between meals. Oftener than once, I have found the water which was yielded by the public fountains with which the streets have been so recently decked, turbid with living and dead impurities, and therefore utterly unfit to drink.

That an ample supply of clothes, of food, of warmth, of light, and of things graceful and useful in respect of house and dwelling-places generally, should subsist for all, is incontrovertible. Nature furnishes a perfect plethora of means, but until education of a vastly higher class pervades the millions, and temperance and self-restraint become general, I do not see how so desirable a consummation is to be effected. People, in general, are not

half clothed, half fed, or half warmed; and as for grace, and comfort, and convenience, they are at a terrible premium. We have food, but people do not know how to cook it. The art of cookery, as practised, would be unworthy of savages. People do not know how to boil a potato or prepare a stew. The Norwegian Kitchener and Captain Warren's improvements are alike ignored. Our bread, too often, is an abomination. The bran, most unwisely, is rejected. Various desirable useful grains and pulse are neglected, if not wholly unknown. Milk is adulterated, and otherwise quite insufficient. Meat and eggs, with fruit and vegetables, are scarce and dear; while good, cheap, and wholesome wines and ales are either burdened with injudicious fiscal restrictions, or, in common with other articles of consumption, so adulterated as to impair or destroy their natural useful characteristics, and render them a curse rather than a blessing to those who consume and, indeed, too often abuse them. I have said enough, if only the inferences were turned to proper account, to prove of no little usefulness. But if my suggestions remain unheeded, whether I say much or little is unavailing alike. The latter half of the alternative I am not, however, disposed to embrace. Sanitary, must follow in the wake, if it do not march in the van, of other improvements; and, soon or late, men will see and feel that health is as well worth struggling and striving for, as are certain other matters which hitherto have only too much constituted the goal of their ambition.

THE
SANITARY RECORD.
SATURDAY, JULY 3, 1875.

The current number of the SANITARY RECORD *commences the Third Volume. The present is therefore a convenient time for new subscribers to commence taking the journal. A copious Index is in preparation, and will be shortly issued free. The Second Volume will be strongly bound in cloth, price 12s. 6d. Annual Subscriptions to the* SANITARY RECORD, *post free, 19s. 6d. per annum.*

SWIMMING LESSONS FOR POOR CHILDREN.

WE are glad to direct attention to an excellent movement which has just been commenced in the metropolis, the object being to give free instruction in the art of swimming to the children in the London board schools. In a paper which will be found elsewhere, on the subject of 'Evening Bathing in Victoria Park,' reference is made to a deputation from the Metropolitan Bathing Association which waited on Lord Henry Lennox on the 11th of last month, in order to ask his lordship to allow the privilege of week-evening bathing, which was granted for the first time last summer in the East-end park, to be continued during the present season. In replying to the deputation on the subject of their request the First Commissioner of Works stated incidentally that he had been asked by the London School Board to grant the use of the Victoria Park bathing-lake for one hour every Saturday, in order that the School Board boys might be taught swimming. The board promised that if their request was complied with they would see that order was preserved, and that there should be no irregularities or abuse of the privilege. The request was readily complied with; and in referring to the concession Lord Henry Lennox said: 'This privilege will not take anything from the public, and I think that the House of Commons and the country will be of opinion that it is advisable that once a week an hour or two should be set aside for this purpose.' He added: 'I am very anxious for the success of this movement.'

This concession of the Chief Commissioner of Works has led to more important results than were at first anticipated. Last week a number of influential gentlemen, including the Lord Mayor, Sir Charles Reed, Sir Antonio Brady, Sir Frederick Arrow, deputy-master of the Trinity House, the Hon. C. Fitzwilliam, Mr. Currie, Mr. Macgregor, and several other members of the London School Board, held a meeting at the Mansion House for the purpose of taking the necessary steps in order to raise a fund to be applied to the object of instructing in swimming the children both of the board schools and of other elementary schools in the metropolis. The idea, it seems, originated with 'The London Schools Swimming Club,' and the funds which it is proposed to raise—by voluntary subscriptions, and not by School Board rates—are to be applied in defraying the expense which may be entailed by the promotion of increased means of bathing in the metropolis, and in providing swimming lessons for teachers and pupils in board and other elementary schools in the metropolis.

The proprietors of a large number of the public swimming-baths have come liberally forward to meet this excellent movement, and have undertaken to admit the boys who may come to them under arrangement at the small charge of from three farthings to three-halfpence each. Sir John Bennett and several other gentlemen have promised swimming prizes as an encouragement to the boys who may avail themselves of the proposed swimming lessons.

Sir Charles Reed, who presided at the Mansion House meeting last week, stated that the movement, so far as the East of London was concerned, had been attended by the most marked success—no less than 2,000 children having accepted the facilities offered them for bathing on Saturday evenings in Victoria Park. The girls of the School Board schools have not been forgotten. It is intended, for their accommodation, and in order to teach them the art of swimming, to make arrangements by

which swimming lessons can be given to them at some of the larger London baths. Of course, as Sir Charles Reed pointed out, the money ofthe ratepayers could not be appropriated in order to defray the costs of this movement, and hence the necessity for a special and voluntary fund. The meeting having adopted a resolution to the effect that it was 'strongly of opinion that systematic instruction in the art of swimming should be given to the scholars attending public elementary schools in the metropolis,' and also a further resolution to the effect that in order to carry out the first a fund must be at once started, the Lord Mayor came forward and promised to give ten guineas to head the list. His lordship further offered to receive at the Mansion House any subscriptions which may be forthcoming towards the fund.

A lady—Miss Chessar—was present at the meeting, and she took the opportunity of claiming, on behalf of the girls in the board schools, the benefit which it was proposed to confer on boys by teaching them swimming. She made the sensible remark that it was just as necessary for girls that they should be taught the habits of cleanliness which swimming will promote, and that they should secure the healthy exercise which the practice affords; and she referred to the large number of women who were lost in the great shipping disasters, ascribing the catastrophes to the fact that they were unable even for a minute to hold themselves up in the water until help could reach them.

We anticipate great good as the result of this admirable movement for teaching poor children the useful and necessary, yet most neglected, art of swimming; and we heartily wish it every success. Sir Frederick Arrow might well say, as he did at the Mansion House meeting last week, that England is far behind other countries in the attention which it paid to swimming. Our deficiency in this respect is notorious, and the fact is most discreditable to us. But it is quite time that we should mend our ways, or it will have to be said of us that we have fairly earned the appellation of 'a nation of shopkeepers,' and that we are fit for nothing else.

The arguments which can be adduced in support of the excellent movement for promoting the teaching of swimming amongst the children of board schools can, of course, be equally applied in the case of all schools; and this branch of the subject is one that deserves further attention at our hands. But, confining ourselves at present to the particular movement under consideration—namely, that having reference to the teaching of swimming to the children of the poor—we venture to point out that one very important result of this movement will be, we trust, the removal hereafter of the stigma which at present rests upon our sailors. It is a curious and a remarkable fact, and one that is well known, that there is a discreditable ignorance of the art of swimming amongst our sailors. These, it is fair to presume, will henceforth be largely recruited from the boys of our board schools; and, if in these institutions swimming be systematically taught, there should be no excuse for the seamen of the future if they cannot swim.

We have not lost sight of the hygienic aspect of this important question. But as our present remarks refer more especially to the particular movement for teaching swimming to the children of the London board schools, we have reserved that especial phase of the subject for subsequent discussion. We chiefly desire on this occasion to direct attention to the fact that the metropolis has initiated a movement for promoting the teaching of the art of swimming amongst the children of the poor. But that movement must not be confined to London.

Notes of the Week.

A NEW METROPOLITAN SICK ASYLUM.

ON the 24th ult. the President of the Local Government Board was present at the opening of a new asylum for the sick poor, which has recently been erected by the managers of the Central London Sick Asylum District, on the site of the old Strand Union workhouse, in Cleveland Street, Fitzroy Square. The managers of the same asylum district already possess a similar institution at Highgate, both having been erected under the provisions of the Metropolitan Poor Act of 1867, for the purpose of receiving, from the workhouses of the co-operating unions of the district, cases of acute sickness. The new asylum has accommodation for 281 patients, exclusive of the necessary staff. The total cost of the asylum, including its site and the furniture, amounts to 32,458*l.*, equal to 115*l.* 10*s.* per bed; the necessary provision for the staff is included in these amounts. The President of the Local Government Board having expressed his entire satisfaction with the institution, its arrangement, and fittings, the hospital was formally declared to be open by Sir Sidney Waterlow, the chairman of the board of managers of the Central London Sick Asylum District.

EVIL FOUNDATIONS.

MR. ALDERMAN BENNETT, of Liverpool, recently wrote to the Local Government Board calling attention to the unhealthiness of certain foundations laid down by the health committee of that town, the foundations in question consisting of road-sweepings and the contents of ash-pits. The chairman of the committee resented this method of procedure on the part of Mr. Bennett, and said that it was unfair, unjust, and ungenerous. Whatever breach of town council etiquette Mr. Bennett may have committed in apprising the Local Government Board of the very objectionable foundations which the health committee were sanctioning, there can be no doubt that he has done good service by calling the attention of the authorities to the evil. The matter was discussed fully at the Sanitary Conference at Birmingham, and suggestions made which, if carried out, would have the effect of preventing building-grounds being made the receptacle for all manner of filth and refuse, previous to being built upon, to the detriment of the health of the subsequent dwellers thereon. The evil is one not confined to any particular town. We have an instance in the Euston Square gardens at the present moment. The remedy should be, therefore, one of universal application, and rigidly enforced.

ANTI-VACCINATORS.

A 'GREAT demonstration' was made at Banbury the other evening against the compulsory Vaccination Act, at which the Rev. Horne Rothery, of Cheltenham, was again the prime mover. The occasion of the demonstration was the release from Northampton Gaol of a man who had suffered fourteen days' imprisonment rather than have his child vaccinated. On the arrival of the released prisoner crowds of persons carrying banners, and attended by bands of music, met him at the station, and presented him with a purse of gold; a meeting was subsequently held, at which the usual speeches were made, and the usual resolutions passed in condemnation of the Act. There is little doubt but that other sham martyrs to this useful Act, may be obtained by the prospect of a similar reward in the shape of a purse of gold. The real martyrs are beyond reach of purses or testimonials.

FEVER HOSPITALS.

THE small-pox epidemic in Birmingham has somewhat abated, and the guardians of Aston, within which union is situated a considerable portion of the borough of Birmingham, are already beginning to discuss the disposal of the Infirmary building at Erdington which has been used as a small-pox hospital. The opposition to the erection of these hospitals for infectious diseases is so great, that when once established their maintenance is especially desirable, more particularly in close proximity to so large a town as Birmingham. Dr. Buchanan, of the Local Government Board, recently stated, that in order to secure the proper isolation and treatment of zymotic diseases special hospital accommodation should always exist in the proportion of one bed to each 1,000 of the population. It becomes a question, therefore, whether Birmingham can spare the small-pox infirmary at Erdington.

A SOCIAL DANGER.

THE *British Medical Journal* refers to an attack of scarlatina among the guests at a recent entertainment at South Kensington, which is characterised as 'unparalleled in suddenness, variety of age, numbers and rapidity.' Nearly half of the guests at a large dinner party were immediately afterwards seized with symptoms of scarlet fever, and others with the indications of abortive scarlatina-poisoning. Many of the guests at the subsequent reception were similarly attacked. There was no fever previously in the house. All who were seized with fever had partaken of 'cream;' a lady who partook next day was also attacked with scarlet fever. All in the house are believed previously to have been in good health. No other source of infection is at present apparent. Mr. Simon, Dr. Buchanan and Dr. Merriman are engaged in investigating the subject and are receiving the most prompt and active assistance from all concerned.

BIRMINGHAM AND ITS NEIGHBOURS.

SMETHWICK is a hamlet and local board district, lying just outside the borough of Birmingham, and therefore under a different sanitary authority and medical officer of health. At the last monthly meeting of this local board a letter was read which had been received from the sanitary committee of the Birmingham town council, calling attention to the discharge of sewage into the Hockley Brook (within the Smethwick local board), which contributed seriously to the pollution of the stream. The letter stated that the Birmingham sanitary authority were doing all in their power, at great expense, to improve the condition of the stream as it passed through the borough, and were therefore determined to prevent as far as possible its pollution by other authorities further up the stream. It further stated that unless the nuisance were abated the town council would take such proceedings as they might be advised. The Smethwick local board, after some discussion, instructed their surveyor and sanitary inspector to examine and report on the brook.

SUNSHINE.

THE Registrar-General of Scotland has extended the meteorological returns of that country so as to include the number of hours daily during which the sun shines. It is found that Scotland is favoured with an average amount of sunshine varying from 1·650 to 1·750 per diem. In 1874, however, the average was 1·815, which were apportioned as under:—74 in January, 103 in February, 138 in March, 179 in April, 170 in May, 277 in June, 239 in July, 188 in August, 145 in September, 140 in October, 78 in November, and 84 in December. The average was above nine hours a day in June, and not quite two and a half in January.

A LIVERPOOL SUBURB.

THE *Liverpool Daily Courier* recently published an article headed 'Huyton-cum-Roby,' which contained a most alarming account of the sanitary condition of this favourite suburb of Liverpool, including the statement that the annual rate of mortality of the district during May had been so high as 37·7 per 1,000. Such a death-rate in a suburban district at about the healthiest season of the year indeed calls for some explanation. The article, however, in question gives no details which throw any light upon this exceptional rate; and it is well to bear in mind that a month's deaths in a small population, like that of the township referred to, are not to be relied upon for the calculation of a trustworthy death-rate. A rate of mortality of twenty per 1,000 would only signify between five and six deaths during each month in the population of Huyton-with-Roby township, which may be estimated at about 3,500; it is easy, therefore, to see how great a variation in the death-rate one or two more or less deaths in a month would make. We have no recent information as to the causes of deaths in this township, and it may be possible that some zymotic disease may have recently become fatally prevalent, although we strongly incline to the opinion that the *Daily Courier* would have mentioned such a fact, as the object appeared to be to make the strongest possible case against Huyton. We have turned to the Registrar-General's quarterly returns for 1874, and, from the deaths recorded in the Huyton sub-district during the year, it appears that the rate did not exceed 14·8 per 1,000 upon an estimated population of 5,555, and the zymotic rate was 2·7 per 1,000. This sub-district includes the townships of Knowsley, Torbock, and part of Much Woolton, in addition to Huyton. During the first three months of this year the death-rate of the sub-district was equal to 21·8 per 1000. Unless, therefore, there has been since then an outbreak of epidemic disease there is nothing very alarming in the recent death-rate of the place. It is quite possible, however, that sanitary defects exists in Huyton; and while we are of opinion that highly coloured and alarming statements as to death-rates and sanitary condition hinder rather than help the cause of sanitary progress, we do not doubt that the public discussion of local health matters, if temperately and impartially conducted, is of the utmost value. If the sanitary condition of Huyton-cum-Roby is as black as it is painted, it would be unwise for the local sanitary authority to be lulled into security by the moderately low recent death-rates we have pointed out.

COLONIAL BEER.

WE have recently heard much about the adulteration of our articles of food and drink; it is unsatisfactory to find that, so far at least as beer is concerned, matters are much worse in Australia. In an article on 'Colonial Beer from a Medical Point of View,' by Mr. J. Dunbar Tweeddale, surgeon, in the *Medical and Surgical Review* for April, 1875, the author gives a very gloomy account of Australian beer. He says: 'In Victoria free-trade in brewing allows any man to manufacture beer according to his own will and pleasure, without the slightest restriction or supervision. When the beer passes into the hands of

the publicans its lowness of strength and deficiency in those gently stimulating properties so much prized by beer-drinkers, are compensated for by the addition of cocculus indicus or leaf-tobacco—the poisonous symptoms of these narcotics being mistaken by the consumers for the legitimate results of an overdose of pure spirit. In fact, by these extraneous additions a man who wishes it can get drunk in a very short time and at a small expense. It is very easy to denounce the conduct of the brewers and publicans for knowingly manufacturing and retailing to the public, in many cases, deleterious compounds, but they must live as well as anybody else; and so long as the public expect to buy a glass of good sound beer at a price it cannot be made for, they must not complain when they are deceived. At the same time the Government is equally to blame in allowing the different municipalities to issue licenses to public-houses at their discretion, for usually these licenses are granted to Tom, Dick, or Harry without reference to character or respectability. Free-trade is doubtless an excellent thing in itself, but free-trade in public-houses means that more are licensed than the owners can get a living honestly; and as there is no bait so attractive to the general public as a cheap article, each one tries to undersell the other. The brewers are naturally obliged to follow suit, and study year by year to produce an article which will fulfil the conditions of cheapness, taste, and colour. After a series of years the palates of a beer-drinking community gradually become accustomed to the peculiar taste and after-effects of the Colonial article, so that they actually prefer it to its original prototype. Most doctors, when consulted by patients of the artisan class for functional derangement of the liver or its allied diseases, invariably ask the question, "Do you drink Colonial beer?" The answer in the majority of cases is in the affirmative. As a rule very few medical men think of ordering Colonial beer, either as a drink or a tonic, as its uniform tendency in persons out of health is to disorganise the functions of the liver and stomach.'

It is further stated that, at a recent inquest, remarks were made by a medical man on the poisonous effects of Colonial beer which have quite stirred up a hornets' nest, all the parties indirectly accused vehemently denying complicity in anything of the kind.

Report.

WHAT THE PEOPLE DRINK.

THE following is a report of various analyses made by Dr. J. Tripe in his capacity of public analyst, in pursuance of directions given by the sanitary committee of the Hackney District Board of Works. During the past quarter he had procured and submitted to analysis thirty-one samples of wine, beer, and spirits. These were obtained from licensed victuallers, grocers, and wine stores, but without notice having been given to the vendors of the purpose to which they were to be devoted. The object was to ascertain the quality of such articles sold in the district. Two out of four samples of port were of the kind known as Spanish red, and one of these contained a large quantity of elderberry juice, whilst the other two were mixtures of Spanish red and Oporto wines. The whole were highly fortified with a coarse spirit, and afforded an offensive and fiery distillate with scarcely any vinous smell. He believed the admixture was made before the wine reached this country. All the ports contained foreign colouring matter. One of the sherries was, if possible, worse than the ports, as he believed it did not consist of any wine at all, but was merely a mixture of coarse spirit-colouring and flavouring to imitate wine. The other two gave very little vinous flavour when distilled, and the spirit obtained, though scarcely as bad as that from the port, was of a fiery and offensive character, and was much more disagreeable than that distilled from British wines. The brandies were nearly as bad as the wines. Two of the samples purchased for 2*s.* 4*d.* per bottle were 40 per cent. under proof, and gave as a distillate a coarse, fiery, offensive spirit, without any brandy flavour whatever, the whole of the flavouring having been left in the retort. Two other samples, for which 3*s.* 6*d.* per pint was paid, were better, one being only 17 under proof, and gave a cleaner spirit on distillation, with, however, but little brandy flavour; and the other was 30 under proof, pretty good in quality, and yielded spirit having fair flavour and smell. The added spirit in the two last was coarse, and was probably grain spirit, whilst that in the other two possessed the unpleasant qualities of the potato spirit. Four samples of gins were tested, and were found to be from 31 to 47 under proof, but with the exception of water and sugar they did not contain any added ingredients. The spirit of three was very good indeed, whilst the other only contained a little 'feints' from having been distilled too closely or from being imperfectly rectified. The whiskies were good, the spirit in each of the three samples tested being pure and sweet. A sample of rum sold at 2*s.* a pint was good, and yielded a pleasant-smelling soft spirit, but another at 1*s.* 8*d.* per pint was inferior in quality, the distilled spirit being somewhat coarse and fiery. In no case was there any trace of added deleterious ingredients in the spirits such as may be called an adulteration; but undoubtedly the fusel oil in the common offensive spirit which was added to the wines, and of which the cheap brandies chiefly consisted, must, when taken in large quantities, produce headache and deranged digestion. As fusel oil is an ordinary constituent of spirit distilled from the marc of grapes, from fermented barley, potatoes, and rye, when the distillation is carried beyond a certain point it is to be considered an impurity rather than an adulteration. Three out of five samples of porter were found to be of the ordinary specific gravity, whilst two were so low in this respect as to indicate the presence of added water to the extent of 20 to 33 per cent. respectively. The bitter ales in four out of five samples tested were not flavoured by hops only, as the taste of chirata was plainly perceptible in the tincture made from the beer solids. He did not detect iron or any other adulteration. He was not prepared to say that chirata did not produce as good a bitter as that of the hop; and as to the low specific gravity of one of the samples, he could not have certified to added water, as there was no fixed standard by which the case could be decided, but the amount of total solids was in this instance one-third less than he had found to be the average. In concluding his report Dr. Tripe observed that, as a rule, cheap wine, beer, or spirits should be carefully avoided by those who are subject to headache, or who suffer from impaired digestion; and expressed an opinion that it was much to be regretted that wines and brandies strongly fortified with spirit should be imported into this country.

It was resolved that the report be received and printed, and that it be referred to the sanitary committee to consider as to what action should be taken thereon.

Medical Officers' Reports.

MACCLESFIELD.

THE causes of the excessive mortality from phthisis, and amongst infants, are dealt with in a report which Dr. Bland has presented to the Town Council of Macclesfield. The death-rate from consumption is, in some parts of the borough, as high as 12·4 per 1000, but it does not, to any great extent, appear to be due to the occupation of the people, for excepting a few of the inhabitants who are employed

in cotton factories and in silk-waste dressing, the staple trade of the place, namely, silk manufacture, is not believed to cause any material injury to health. A general survey of the town, however, shows that this death-rate is highest in streets which are either undrained, or which from their low-lying position are imperfectly drained, and the relation between consumption and dampness of subsoil is clearly proved by local experience. The deaths under one year of age are at the rate of 18·7 per 100 registered births, and this unnecessarily high mortality, though to a considerable extent due to the employment of mothers in factories, and to the consequent neglect of infants, is also much increased by the want of proper sanitary arrangements in the poorer portions of the town. Dr. Bland discusses the various proposals which have been made with a view of checking the employment of mothers in factories, and he gives his reasons for the belief that no such remedies as those contained in Mr. Mundella's Factory Bill will, to any material degree, tend to the saving of infant life. While, however, advocating the exclusion of women from factories for at least a month subsequent to their confinements, he relies on the sanitary education of the lower classes as the principle means by which the lives of children are to be saved in factory and in other towns.

TAUNTON.

THE annual death-rate in the Taunton local board district for 1873 was only 18 per 1,000 living; a fact which must to some extent be considered as due to the careful manner in which steps were taken to prevent the spread of scarlet fever, which became slightly epidemic during the year, by means of proper disinfection, carried out under the directions of Dr. Alford, the medical officer of health. The points which at the present moment appear to call for sanitary action are—first, the provision of a better water-supply, some of which is now derived from polluted wells; secondly, the removal of the nuisance caused at the outfall of the town-sewer; and, thirdly, the abolition of all common privies. Many sanitary improvements have recently been adopted in the town, and amongst these is a system of sewer-ventilation through charcoal; but hitherto the difficulties attending the use of this substance in sewer-ventilators, and, above all, the practical impossibility of renewing it as frequently as its minute pores become blocked with the aqueous vapour rising from the sewer, have so much interfered with its utility as to lead to its abandonment in some cases.

The Health of Watering Places.

IV. LOWESTOFT.

THE area within the boundaries of the Improvement District of Lowestoft may be taken to represent the watering place so called; this area includes 2,264 acres, of which 240 are water. The Improvement District is co-extensive with the two parishes of Lowestoft and Kirkley; these parishes had a population of 7,580 persons in 1851, which increased to 10,663 in 1861, and to 15,246 in 1871. This increase was equal to 40·7 per cent. during the decade 1851–61, and to 43·0 per cent. between 1861 and 1871. The annual rate of increase in the ten years previous to the last census was equal to 3·6 per cent.; and assuming this rate to have been maintained since 1871, the population in the middle of 1874 may be estimated at 17,125, and in the middle of this year at 17,748. The value of the vital statistics, calculated upon estimates of population, depend so entirely upon the approximate accuracy of those estimates that it is always desirable to apply to them the test of the birth-rate, which does not in the same community vary very considerably from year to year. In the registration sub-district of Lowestoft, which includes, besides the parish of Lowestoft, nine rural parishes, having in 1871 a population of 3,648 persons, the average annual birth-rate during the ten years 1861–70 was equal to 33·8 per 1,000. The 641 births registered in this sub-district in 1874 were equal to a rate of 34·0 per 1,000 of the estimated population of the sub-district at the middle of the year. The close approximation between the annual birth-rate in the ten years 1861–70, and that calculated in 1874 upon the estimated population, may be taken as evidence that this estimate is approximately correct, and thus implies the trustworthiness of the mortality statistics, which we will now proceed to discuss.

In the Registrar-General's Watering Place Table, the registration sub-district of Lowestoft is taken to represent the watering place of that name. This registration sub-district, as before stated, includes, besides the parish of Lowestoft, nine other parishes, principally rural, having in 1871, a population of 3,648 persons; the parish of Kirkley, which had in 1871 a population of 1,626, is situated in the sub-district of Kessingland, and is thus excluded from the area taken by the Registrar-General to represent the watering place. The effect of this is that the Lowestoft figures in the Registrar-General's Watering Place Table relate to a population exceeding by about 2,000 the correct population of the improvement district, and are, moreover, favourably affected by the inclusion of the rural parishes and the exclusion of Kirkley, which is an integral portion of Lowestoft. As we shall presently see, however, the effect produced by this variation of boundaries upon the mortality figures is really very slight.

During the year 1874, 276 deaths were registered in the two parishes of Lowestoft and Kirkley, that is, within the Improvement District. The Mutford and Lothingland Infirmary, being situated within the Improvement District, the deaths occurring therein are included in the above number. The Union Workhouse, however, is situated in the outlying parish of Oulton. It is probable that some of the deaths in the infirmary were of non-residents, whereas, of course, a considerable number of the paupers dying in the Union Workhouse were admitted from Lowestoft. Without accurate information as to the place of residence of all the inmates dying in these institutions, it would be impossible to make a completely satisfactory correction for this disturbing element; for present purposes it will probably be sufficiently accurate to add eight deaths to those actually registered within the district as its quota of workhouse deaths, after proportional allowance for the deaths of non-residents in the Infirmary. These 284 deaths yield a death-rate for the Lowestoft Improvement District during 1874 equal to 16·6 per 1,000. The rate of mortality in the sub-district, used by the Registrar-General to represent Lowestoft for the year 1874, was 16·0 per 1,000 after a similar correction for deaths in institutions, showing a slightly favourable result from the inclusion of the rural parishes and the exclusion of Kirkley. The death-rate in Lowestoft in 1874 was satisfactorily low, calculated for either of these two areas. The death-rate in the rural population of England and Wales averaged 19·3 per 1,000, and exceeded by 2·7 the rate in Lowestoft Improvement District. In the ten years, 1861–70, the average annual death-rate in Lowestoft sub-district was 19·2 per 1,000; this rate, however, is uncorrected for deaths in institutions. In the three years 1871–3, the sub-district death-rate, after correction for deaths in institutions was 19·7, 17·4 and 16·9 per 1,000 respectively; it thus appears that during the past four years there has been a steady improvement in the health of Lowestoft.

It will be useful now, briefly, to consider the causes of death within the Lowestoft Improvement District during 1874, and especially of those referred to zymotic diseases. The 284 deaths from all causes included eighteen which were referred to different forms of fever, twenty-five to diarrhœa, three to whooping-cough, and one each to measles, scarlatina, diphtheria and small-pox; in all, fifty deaths resulted from these seven principal zymotic diseases, showing a death-rate of 2·9 per 1,000 of the estimated population, and equal to a proportion of 18 per cent. to the deaths from all causes. The death-rate from these diseases in the whole of England during 1874 was 3·6 per 1,000 while the proportion to total deaths did not exceed 16 per cent. The zymotic death-rate in Lowestoft, considering the low rate from all causes which prevailed, was undoubtedly too high, and more particularly was the death-rate from fever excessive. The eighteen deaths referred to fever in Lowestoft were equal to a rate of 1·05 per 1000, whereas in the whole of England and Wales it did not exceed 0·56; of these eighteen fatal fever cases, three occurred in Kirkley, two each in Shuckford's Loke, Jacob Street, and the Beach, while two were recorded in the hospital. The death-rate from fever in Lowestoft was exceptionally high in 1874, as in the two preceding years it was below the average rate in the whole of England. The only other zymotic disease which calls for special notice is diarrhœa, to which twenty-five deaths in Lowestoft were referred in 1874, including eighteen of infants under one year of age, of which thirteen occurred in the September, and four in the early part of the December quarters. The death-rate from diarrhœa during the third or summer quarter of the year was equal to an annual rate of 3·5 per 1,000; in the whole of England this diarrhœa rate averaged 2·4 per 1,000 in the same period, and in fifty towns, with populations ranging principally between 30,000 and 100,000, it was 3·0. It has been previously shown in this series of articles that the annual death-rate from diarrhœa in the summer quarter of last year was 2·1 per 1,000 in Yarmouth, 4·9 in Margate, 2·7 in Ramsgate and St. Lawrence, and 3·6 in Broadstairs. The three deaths from whooping-cough in Lowestoft during 1874 included one in each of the last three quarters of the year. There is only one other class of diseases which it is possible here to notice, namely, those of the respiratory organs and phthisis, to which sixty-five deaths were referred in 1874, equal to a rate of 3·8 per 1,000. In London during last year the death-rate from these diseases was equal to 7·2 per 1,000. Taken separately the rates from diseases of the respiratory organs and phthisis in Lowestoft were—2·4 from diseases of the respiratory organs, and 1·3 from phthisis, each about half the rates from the same causes in London.

During the year 1874 the deaths of infants under one year of age registered in Lowestoft were ninety-one, equal to 158 per 1,000 of the 576 births registered within the Improvement District; this rate was seven per 1,000 above the average proportion of infant mortality in the whole of England and Wales. Infant mortality in Lowestoft did not show the large increase during the third quarter of the year which was conspicuous in the watering places previously dealt with; indeed the rate showed but slight variation in the four quarters of the year. The ninety-one deaths of infants in Lowestoft in 1874 included eighteen from diarrhœa, seventeen from diseases of the respiratory organs, seven from premature birth, and thirty were returned under the somewhat indefinite headings, convulsions, atrophy, and debility.

The enumerated population of Lowestoft in 1871 contained a proportion of 7·5 per cent. of persons aged sixty years and upwards. If this proportion has been maintained, the Improvement District contained 1,290 persons of those ages in the middle of 1874; during that year seventy-three deaths of persons aged sixty years and upwards were registered, which gave a death-rate at these ages of 56·6 per 1,000. This rate was no less than 15·4 per 1,000 less than that which prevailed in the whole of England and Wales in the same period, and was lower than that in any of the other watering-places we have previously noticed; this death-rate among persons aged sixty years and upwards was 65·1 in Yarmouth, 62·5 in Margate, and 60·0 in Ramsgate, whereas, as before stated, it was only 56·6 in Lowestoft during the year.

During the first three months of this year ninety deaths were registered within Lowestoft Improvement District, including three deaths which occurred in the workhouse, situated outside the boundaries of the district; these ninety deaths were equal to an annual rate of 20·6 per 1,000. This rate considerably exceeded the low rate which prevailed in the district during 1874; this was probably due to the same causes which produced a generally excessive rate in the whole of England and Wales, namely, the severe winter and the consequent fatality from diseases of the respiratory organs. To the seven principal diseases of the zymotic class, only five deaths were referred in Lowestoft during the first three months of 1875, including two from whooping-cough (neither of which deaths were certified by registered medical practitioners) and one each from gastric fever, scarlet fever, and diarrhœa; the death-rate from these seven zymotic diseases was so low as 1·1 per 1,000 during these three months, whereas in the whole of England and Wales it averaged 2·9 per 1,000 in the same period. With reference to the mortality from zymotic disease it is satisfactory to know that Lowestoft possesses a Floating Hospital belonging to the Port Sanitary Authority, in addition to the Sanatorium, which is available for the Urban Sanitary Authority; this hospital accommodation, if turned to the best account, affords the means for successful isolation and treatment of cases of zymotic disease, which cannot fail to be of infinite value to the residents of Lowestoft, as well as to its visitors.

It may well be concluded from the foregoing examination of the recent vital statistics of Lowestoft, that the general health of its residents is eminently satisfactory so far as may be judged from the death-rate. The causes of the excessive rate of infant mortality, however, require investigation. The exceptional fatality from typhoid fever in 1874, should, moreover, serve as a warning to the sanitary authorities that the sanitary condition of the place is not yet so good as it might be made. The deaths in Tonning Street seem to be excessive. The deaths from fever in 1874 were not confined to Lowestoft, as several occurred in neighbouring villages, the sanitary condition of which is of considerable importance to Lowestoft as a watering place. It would be well if they could be placed under the same sanitary authority as Lowestoft.

The low death-rate of Lowestoft fully warrants the popularity it has of late years been obtaining as a watering place. Situated as it is on a stretch of coast that runs out still further east than the North Foreland, and being, indeed, the most eastern spot in England, almost all that has been said of the bathing places of the Isle of Thanet, and of what has been said of Yarmouth, applies to it. Lowestoft is much smaller than Yarmouth, and is built mainly on a cliff and its slopes. It stands higher. It has more air and more extensive views. It is less of a commercial town and more of a watering place; indeed, of late years it has been a very crowded one. There is good bathing ground, and there are bathing machines and baths—and all the usual amusements of such places. The relaxations are much the same as those of Yarmouth; and besides promenades on the esplanade and the piers, the chief resources of the visitor are in boating and sea-fishing, and taking excursions in the little steamers which ply along the coast. The chief object of architectural interest is St. Margaret's Church, a large edifice containing various interesting monuments. Lowestoft is especially a place for those who like sailing: and to most people, taking a sail is a very healthful proceeding. Of course, many of those who are unaccustomed to sail will get sick at first—but such sickness in moderation rather does good than harm. There are, however, a few people, women especially, in whom sea-sickness is so depressing, or who, without becoming sick, suffer from

headaches which may last so long, that they ought to avoid sails, and remain on shore. We have little faith in any remedy for sea-sickness; no doubt in the great majority of people a tight band round the abdomen and the prone position are of some use. We fear much cannot be expected from ice-bags, or from ten grain doses of calomel, which we have lately seen recommended, or from the hundred and one remedies which one hears of. Champagne and chloral both may be of use; but we do not recommend boating or pleasure-trips to any one who requires such aids. Such persons must be content to do without the pleasure of inhaling the refreshing and invigorating sea air, as a boat cuts its way through the water. There is little question that large steamers with good airy saloons will diminish sea-sickness, but no one who has seen how readily some are made sick by the smell or by the tremulous motion of a steamer, can hope for absolute prevention of sickness by any means which have been hitherto devised.

We have already said a good deal about sea air and sitting in the open air by the sea-side. Of course we do not advise that people should sit too long, or not take the ordinary precautions against catching cold. However, it seems to be ascertained that cold is not so easily caught at the seaside as in inland places, and undoubtedly catarrhs are not so common on board ship as on shore. We have also happened to know of cases of hay fever which were immediately relieved by going to the seaside. In all ages, too, virtues have been ascribed to 'a sniff of the salt water,' and an increase of appetite, and a corresponding *embonpoint* are usually attributed to its influence.

Sea water varies in strength in different parts of the world; that of the Mediterranean is strong, that of the Baltic particularly weak. The average, which applies to the German Ocean, gives about 346 parts in the 10,000, about 250 of which are common salt, thirty-three of chloride of magnesia, thirty sulphate of magnesia, twenty-four carbonate of lime, but the properties vary, and the Mediterranean has less lime and more salts of magnesia. In a general way it may be said that a pint of sea water contains about three drachms of common salt, twenty-five grains of sulphate of magnesia, thirty grains of chloride of magnesia, and sixteen grains of lime. It also has a variable amount of organic matter in it, often palpable to the taste or smell or even touch. Salt water has from the earliest ages been occasionally used internally as a purgative. The ancients gave it mixed with wine, or honey, or rain water. One of those mixtures was called thalassomel. Its internal use had long been quite given up, when it was revived by Russell in the middle of last century. He proclaimed it a cure for all scrofulous affections; and its use became very extended indeed, but it is now nearly forgotten again. It survives indeed in Italy to a considerable extent. It is occasionally used by the lower orders in this country, as testified to by Johnnie Gibb, who describes the repugnance of a youngster who rebelled against his draught of it, because it was 'terrible coorse.' Its taste is indeed nauseous, and cannot be in any way concealed. A French writer of recent date, while not advising its internal use as a purgative, both as being bulky and somewhat uncertain in its action, says that he has derived very decided advantage from employing it, in small doses, as a tonic and alterative in children. He strongly recommends the practice, common among the ancients, of using it warmed in clysters; and says that he has often found it extremely useful when small worms have been present in the rectum. Indeed, from our experience of some cognate solutions of salts, we think it likely that sea-water drunk ought to be a good anthelmintic. Of late years sea-water has been employed in making bread in some parts of France, and it is said to improve its quality. Entirely disused though salt-water is at present in England, it is no longer ago than in 1828 that Dr. Harwood wrote that 'its internal use may be considered to stand high on the list of advantages afforded to an invalid by his residence on the coast;' and at the present day Italian physicians give fifteen-days courses of it, and find its action very useful not only in scrofulous cases, but in many visceral and uterine congestions. If it were only a pleasanter remedy, there is no reason why it should not be as efficacious as many a mineral water that has enjoyed popularity. It is far superior to many of them. In former times people were particular about drinking sea-water in its greatest purity, taken up some leagues at sea. Patients may, nevertheless, be satisfied with such sea-water as Lowestoft supplies.

Parliamentary Proceedings.

NOTICES OF MOTION.

MR. BUTT has given notice that on the second reading of the Agricultural Labourers' Dwellings (Ireland) Bill, he will move, that an humble address be presented to Her Majesty, praying that Her Majesty may be graciously pleased to issue a Royal Commission to inquire into the condition of the dwellings of agricultural labourers in Ireland.

Mr. Balfour will move that the bill be read a second time upon this day three months.

The House of Lords has agreed to the following bills:

Metropolis Management Acts Amendment Bill; Worthing Gas Bill; Tunbridge Wells Gas Bill; Blackburn Water Bill; Longwood Gas Bill, with Amendments; Artisans Dwellings Bill, without Amendment.

The Royal Assent has been given to the following bills:

Artisans' Dwellings Bill; Metropolitan Management Acts Amendment Bill; Public Health (Scotland) Provisional Order Confirmation (No. 3) Bill; Local Government Board's Provisional Order Confirmation (No. 2) Bill; Local Government Board's Provisional Orders Confirmation (No. 3) Bill; Bradford Water and Improvement Bill; Millom Gas and Water Bill; Portishead District Water Bill; Truro Water Bill; Market Rasen Water Bill; Widnes Local Board Bill; Inverness Water and Gas Bill (Lords); Leicester Water Bill; Middlesborough and Stockton Street Tramways Bill; Salford Tramways and Improvement Bill; Busby Water Bill; Hamilton Water Bill; Chelsea Water Bill.

HOUSE OF LORDS.

(*Friday, June 25.*)

POLLUTION OF RIVERS.

THE Marquis of SALISBURY said he had been astonished at the wide interest in this subject, as evidenced by the stream of deputations that had waited upon him in respect to it. Having regard to the state of business in the other House, the Government had considered whether this bill should be withdrawn or reduced in its extent. The latter course had been resolved upon, and he hoped there was now no complication in the measure which would prevent its being passed this session. The bill was in three divisions. The first related to the keeping of solid matters out of rivers, upon which he found in the deputations no difference of opinion. The clause was made more stringent which prohibited the deposit of solid refuse in places whence it would be swept into the streams by floods. It was also to be an offence to cast solid pollution into a stream, even though the amount thrown at one time should not be sufficient to interfere with the natural flow. The second division of the bill related to sewage, and it proposed that after a limited period corporations and public bodies should cease to cast the sewage into rivers, or that, if they were compelled to cast it into rivers, they should apply the best available means to purify the sewage matter before it entered the river. The third point was how to deal with mining and manufacturing interests, and this was so difficult a question that in the main it would be reserved for full discussion next year, the bill providing now that no manufacturing pollution should enter any channel into which it had not passed at the beginning of this year. Vested interests actively existing at present would not therefore be touched this year. The only other alteration was in the definition of the word stream, and he proposed to enact that nothing should be considered a stream which

was not acknowledged *eo nomine* by the Local Government Board. He moved that the House should go into committee upon the bill.

After a few remarks from Lord Aberdare, Lord Selborne, the Duke of Cleveland, the Lord Chancellor, and Earl Granville,

The Marquis of Salisbury said he had omitted to state it was proposed to put in the bill that no sewage offence should arise until after the close of 1876.

The House went into committee, and the bill passed through.

(*Monday, June* 28.)

PUBLIC HEALTH BILL.

THE Duke of Richmond, in moving the second reading of the Public Health Bill, said that it was not to be taken as a permanent settlement of sanitary legislation, or else the Government might be open to criticism elsewhere, on the ground that they had not redeemed the pledges which they had given to use all their efforts to deal with sanitary questions generally. The real intention of the bill was to amend and consolidate the present laws, and, although it consisted of no fewer than 340 clauses, it was not of so gigantic a character as might be supposed. The noble duke, in order to explain the position in which the Government found themselves with regard to a consolidation of the statutes, called the attention of their lordships to the various Acts which were in force upon the subject. The number of Acts which now existed was more than twenty, ranging over a period of thirty years, and the confusion in construing the law had been so great that it had become absolutely necessary that some attempt should be made to reconcile those Acts one with another. The chief amendments had been divided into ten heads. It was proposed to vest the control of sewers in the local authorities; to give power to carry water-mains beyond the districts underground; to incorporate the water clauses; to limit the supply of water; to suppress offensive trades where they were injurious to health; to allow urban authorities to purchase gas water by agreement, under special arrangements named in the bill; to sanction legal proceedings against the joint contributories of nuisances; and to permit local boards to combine for the appointment of proper medical officers of health. The bill was in all respects a first and necessary step to those great sanitary reforms which were proposed to be introduced in process of time (hear, hear).

The Duke of Somerset criticised the bill, and maintained that the Government ought to have introduced some provision for bringing the boundaries of counties and unions into harmony, or else the administrative reforms proposed would be complex and difficult to manage.

The Marquis of Salisbury said that the noble duke's criticisms were mostly foreign to the bill. If their lordships should set their faces against minute improvements of the law because the opportunity had not arisen for bringing in those larger reforms to which a Government might aspire, there would be no inducement to proceed.

Lord Aberdare considered that the Government had taken a step in the right direction, but he thought that some amendment was required to clause 297, so as to give the central authority power to require local boards to do their duty in cases where there had not been a proper inspection of nuisances, an adequate supply of water, and other matters. In fact, the central authority ought to be empowered to enforce the law.

Lord Redesdale approved of the bill generally, and, after a few words from Earl Fortescue, it was read a second time.

ARTISANS' DWELLINGS.

ON the motion of Earl Beauchamp, the Commons amendments to the Lords' amendments to this bill were agreed to without discussion.

METROPOLIS GAS COMPANIES' BILL.

MR. W. E. FORSTER brought up the report of the select committee on this bill.

HOUSE OF COMMONS.

(*Tuesday, June* 29.)

SCOTLAND AND THE PUBLIC HEALTH ACT.

THE Lord Advocate, in reply to Mr. W. Holmes, said that in 1867 he had introduced a bill for the consolidation of the laws relating to public health in Scotland. That bill passed into law, and had been in operation since that time, and it was therefore quite unnecessary to proceed in the way of consolidating the laws on this question. It was, however, at one time, his purpose to introduce a bill for the purpose of making amendments in the existing law, but the state of public business had prevented him from doing so. He was now glad to say that the Chancellor of the Exchequer would consent to his introducing a bill for the purpose of allowing money to be borrowed in Scotland for public works for sanitary purposes at as cheap a rate as in England and Ireland.

LOCAL LOANS.

THE Lord Advocate, in reply to Mr. W. Holmes, said he had obtained the permission of the Chancellor of the Exchequer to introduce a short bill this session to enable local authorities in Scotland to borrow money from the Public Works Loan Commissioners for sanitary purposes at as low a rate of interest as had been conceded in regard to loans to local authorities in England and Ireland.

(*Wednesday, June* 30.)

ARTISANS' DWELLINGS (SCOTLAND) BILL.

MR. CROSS said that early in the session he had promised, the moment the Artisans' Dwellings Bill for England had received the Royal Assent, that he would introduce a similar measure, precisely on the same terms, applicable to Scotland; of course, on the understanding that it should be passed as it was drawn. He accordingly now moved for leave to bring in a bill to facilitate the improvement of the dwellings of the working classes in large towns in Scotland.

Leave having been given, the bill was brought in and read the first time.

The Lord Advocate obtained leave to bring in a bill to amend 'the Public Health (Scotland) Act, 1867,' in respect of loans for sanitary purposes.

Law Reports.

NUISANCE FROM SHOEING HORSES.

VICE-CHANCELLOR BACON had before him the case of *Gullich* v. *Tremlett* on June 9. A suit instituted by the New British Institution, in New Bond Street, a picture gallery, seeking an injunction against the defendant, who carries on the business of a veterinary surgeon in adjoining premises, to restrain him from certain acts of nuisance. These were, offensive effluvia arising in the process of singeing horses, burning assafœtida, and the noise and vibration from forging horse-shoes.—His Honour said that on the main points of the case he was of opinion that a nuisance had been maliciously caused by the defendant, and, therefore, he must grant a perpetual injunction with costs. This, however, would not prevent the defendant from carrying on his business so as not to be a nuisance.

BATHING IN FINSBURY PARK.

Two men have been summoned at the instance of the Metropolitan Board of Works, for unlawfully bathing in the ornamental lake in Finsbury Park. Mr. Cooke ordered the defendants to pay a nominal penalty of 1*s.*, and the costs, observing that it was a pity there were not free bathing places in London, as they would be a great boon to the poor.

MISCONDUCT OF AN UNDERTAKER.

T. COCKS, of Rochester Row, Westminster, has been summoned for procuring to be buried the body of a deceased child, as if it had been still-born. According to the statement made by the solicitor for the prosecution, the child lived only six hours, and the defendant agreed to bury it for 10*s.* No tidings had been heard of the body, and it was supposed that it had been disposed of for anatomical purposes, or had been buried as a still-born child to save the cost of burial. The case was adjourned, bail to the amount of 70*l.* being taken for the defendant.

A FEVER NEST.

Mr. SAMUEL TICKNER, the owner of a house, No. 128, Ormside Street, Old Kent Road, appeared to a summons, at the instance of the parish authorities of Camberwell, charging him with neglecting to comply with a notice served upon him to provide a supply of water to the premises. Mr. Fisher, the sanitary inspector, said the notice for the supply of water was served on April 24, but nothing had yet been done, the tenants in the house having to get water as best they could. At the present time there were four persons in the house suffering from scarlet fever. Mr. Patteson told the defendant that if the supply was not made within seven days he would be liable to a penalty of 5*l.*, and to 40*s.* for every day of continued neglect.

BLOCKING A SEWER.

MESSRS. KNIGHT & SON, soap manufacturers, Old Gravel Lane, Shadwell, was summoned by the Board of Works for discharging rubbish and soap lees into a sewer at York Place. A thick white deposit was found three feet in depth for a distance of about 300 yards; in consequence the water was driven back and the houses flooded. It was alleged to have cost the board 300*l.* during the last twelve months for the removal of such deposit. For the defence it was contended that the deposit had run into the sewer for fifteen years. A complaint was made by the vestry at the end of March and the beginning of April, when the liquid, instead of running into the sewer, was run off into brick pans and carted away. As many as fifty cart loads were carted away once a fortnight. Mr. Lushington, after going through the evidence, said there was no proof that the deposit found at the bottom of the sewer had been formed since April 16. He dismissed the summons, but should not allow costs.

CERTIFICATES OF DEATH.

SIR,—In the event of a medical gentleman signing a certificate of death for a patient never seen by him, but wholly attended by an unqualified assistant, what course would the law adopt? PHILIP S. FENTON, M.D.
June 22, 1875. Medical Officer of Health.

[We are not prepared to say that the law would adopt any course,—or (to be more precise than our correspondent) to say that any offence in law is committed by the medical gentleman under the circumstances stated; of course something would depend upon the precise form of words used, but if a medical man chooses to adopt as his own somebody else's opinion, it is not clear that the law can prevent him doing so.]

ARTISANS AND LABOURERS' DWELLINGS ACT.

SIR,—What will be the relation of the new Act to the Act of 1868, and, indeed, to the group of Acts on the subject? Does the new Act repeal the earlier ones or not?
A. Z.

[The new Act does not profess to repeal any previous statute, but its obvious effect will be to supersede all the earlier Acts, and, without doubt, there will be a consolidation of the law before long.]

POLICE POWERS.

SIR,—The town of C. has adopted the Local Government Act and incorporated therewith the Towns Police Clauses Act, 1847. The county constabulary, who are the only constables in the town, have reported many offences under section 28 of the Town Police Clauses Act, such as obstructions in the streets, stone throwing, using obscene language, but the local board have declined to authorise the police to take proceedings against the parties.

Will you please to state whether the police may not institute proceedings for all offences under section 28, irrespective of any opinion of the local board, and without reporting the matter to them at all? J. R. G.

[Section 133 of the Public Health Act, 1848, seems to debar the police from taking independent proceedings under the Towns Police Clauses Act in places where the latter Act is in operation, merely by reason of the former Act being in force there.]

BUILDING BY-LAWS.

SIR,—Will you kindly favour me with your opinion as to what constitutes the pulling down of an old house to the ground-floor?

Many parties argue that as long as a brick or stone is left above the floor, the erection of a building upon the brick- or stone-work left of the old building cannot be termed a new building, and consequently is free from the observance of the new building by-laws.

My idea is, and many others concur, that as soon as the joists of first floor are removed so as to leave no other floor but the ground one remaining, and that open to the sky, the old building is, for all sanitary purposes, down to the ground-floor, and liable to the observance of all by-laws binding on new houses; if you would kindly help me in this matter, you will confer a favour on yours respectfully, JNO. C. DENNIS, Chairman,
Ilfracombe Local Board of Health.

Ilfracombe,
June 28, 1875.

[Our correspondent's view, if we rightly understand his expression of it, is certainly erroneous. So long as a brick is left above the level of the original ground-floor, the alterations are free of the law. If our correspondent will read carefully the section of the Act on which the question depends, he will see that the removal of a first-floor ceiling cannot, by any stretch of the imagination, be held equivalent to a pulling down to the ground-floor. Not many weeks ago, in a case within our knowledge, counsel advised to this effect, and a local board surveyor abandoned the contest.]

Correspondence.

MAGISTERIAL VAGARIES.

(*To the Editor of the* SANITARY RECORD.)

SIR,—In several of his recent quarterly reports, the analyst for the districts of Greenwich, Plumstead, and Woolwich has pointed out that whereas, in consequence

of the Adulteration Act having been duly put in force, the practice of adulteration of most kinds has sensibly diminished, yet the system of debasing the article of milk by the addition of water, notwithstanding numerous prosecutions for that offence, continues on the increase; and this negative result of his examinations of the milk samples submitted to him, Mr. Wigner (the analyst in question), attributes to the extraordinary leniency, not to say sympathy, which the magistrates have shown for the peccant dairymen guilty of the amiable weakness of increasing their profits by the addition of water in varying proportions of from 10 to 30 per cent. to their milk, and certainly if the penalties imposed in the districts referred to be compared with those in other places, it would appear that these Kentish suburbs form an Elysium for adulterating milk dealers.

One of the worthy magistrates who dispenses law and equity in this favoured locality, has, for a considerable period, satisfied his sense of justice by imposing merely nominal fines on milkmen found guilty of adulteration.

His judgments have read somehow thus:

'I find that by the certificate of the analyst duly appointed for this district, you have been guilty of adding 25 per cent. of water to your milk, thus increasing your profits fraudulently.

'I have no reason to doubt the truth of this certificate, and you produce no rebutting evidence. I shall, therefore, fine you two shillings; but I must say, at the same time, that I consider you a very honest and deserving tradesman, who would scorn to cheat your customers.'

Such decisions were, doubtless, very solacing to the bovine culprits; but excited some amazement and alarm amongst the consumers, who, not being gifted with judicial minds, argued that when they paid the highest market price for a commodity they were entitled to have it in its original state.

However, the magistrate himself, either wearied of the monotony of his own decisions, or overflowing more than usual with the milk of human kindness, determined to try a higher flight still, which he accomplished in the following manner.

Five milk-dealers were summoned at the Greenwich police-court for adulterating their milk, the proportions of water added being respectively 10, 15, 18, 18, and 33 per cent. Not a shred of evidence was either offered or threatened with a view of invalidating the analyst's certificate, and it might have been expected that the magistrate would, as usual, fine the defendants a shilling or so and dismiss them with his blessing.

He, however, pursued a more original course.

He promptly dismissed the case of the man who had added only 10 per cent. of water, on the ground that such a small admixture could not possibly be detected; but the bolder adulterator, whose milk was one-third pump-water, he fined 40*s*., and on the remaining three cases he reserved his magisterial decision for a week.

At the adjourned hearing Mr. Wigner attended, prepared to verify his results on oath, and give the figures of his analyses; and what, it may be asked, was the result?

Perhaps as lame and impotent a one as could be imagined.

The magistrate said he would not have Mr. Wigner examined at all. He did not question the correctness of his analyses, and had no doubt all the chemists in London would confirm them. At the same time he had made up his mind to hear no further evidence, and the defendants would simply be required to pay the costs of the summonses.

I refrain from comment upon this wonderful decision, which however may perhaps suggest the cheering thought to some poor 'incompetent' analyst that he is not the only officer engaged in the working of the Adulteration Act who deserves that distinctive prefix. J. H. SCOTT.

STORM-WATER AND SEWAGE.

(*To the Editor of the* SANITARY RECORD.)

SIR,—With your kind permission I will make a few observations upon some points in your excellent report of a meeting I had the honour of attending at the Croydon Sewage Farm, on the 12th instant.

I quite agree with you in wishing that a regular balance-sheet could have been produced, but under the circumstances, and knowing the extravagant rent of the farm, I am not surprised that its accounts should be withheld, for the present at all events.

You say that if the separate system were in force at Croydon, as it is at Reading, the volume of sewage proper would probably measure about 3,000,000 gallons per diem, while the amount of fluid received at the Beddington Farm under existing circumstances is stated, on good authority, to vary from 3,000,000 to 8,000,000 or 10,000,000 gallons; and I would beg your readers to dwell upon and ponder over these figures until they have realised the enormous weight and volume of water, clean enough originally to pass into any stream, which is thus intentionally fouled by mixture with sewage.

I may observe that, if the 'separate system' were rigidly adhered to, the sewage proper would but little exceed one million gallons for the population in question, and thus the disparity between the sewage proper and the present mixture is so much the greater.

How the manager of the Croydon farm can possibly undertake to deal with sewage varying to such an extent is a mystery to me, for in a climate like ours an hour or so may upset all his calculations; and I confess that I find it difficult enough to arrange for the proper and most profitable utilisation of a comparatively constant volume of sewage.

Certain permanent outlets and overflows from the main sewer, by which any excess of its contents above a known quantity must pass directly into the neighbouring brook, put an impassable limit to the volume for which I need provide room on my land; and as in practice the dry weather flow of sewage proves not to be much less than half that maximum quantity, my task is a comparatively easy one.

If it is a troublesome matter to purify a foul liquid, it must surely be a great mistake to add unnecessarily to its volume before commencing the purification process; and if a town lies under the necessity of pumping as well as purifying its sewage, the advantage of any possible reduction in its volume must in that case be at least doubled.

I have so often publicly urged the merits of the 'separate system,' from the year 1868 up to the present time, that I am almost ashamed of recurring to the subject; but I frequently meet engineers and others as fully convinced as I am myself that it is the right one; and all I have to complain of is the *vis inertiæ* which leads borough surveyors to pass plans for new sewerage works on the old lines, just because it is easier to follow a pattern at hand than to think out the details of a new one.

I visited the Beddington farm some eight years ago, and am glad to have now renewed my acquaintance with it when Dr. Carpenter has rendered it a model for towns exercised by the prospect of a Rivers Pollution Act, which will, I trust, prohibit storm-water overflow in every case for the future.

I have often wondered at the quiet air with which authorities will pass over the iniquity of storm-water overflows; they will lead you to suppose that they are dealing with the whole liquid sewage and rainfall of a district at all times by irrigation, precipitation, etc., and when run to earth in one of the carefully concealed culverts connecting their sewer with the nearest river, they coolly tell you that the storm-water is the 'act of God,' and can never be objected to, on account of the swollen condition of rivers on the 'rare occasions' when their foul mixture of rain-water and sewage overflows into them.

At Birmingham, however, I was freely shown two great archways up which you might almost drive a stage-coach, and told that those were their 'safety-valves' for the 'act of God.' ALFRED S. JONES, Lieut.-Col.,
Hafod-y-wern Farm, Wrexham.

June 27, 1875.

P.S. Since writing the above I have met with a very able paper on 'Town Sewerage,' given in *Engineering* of last week by Mr. Peregrine Birch, Borough Surveyor of Walton-on-Thames, and referring to a back number of the same journal I find that Mr. Birch has fully adopted the 'separate system.'

May I, therefore, ask such of your readers as may take an interest in the subject of the above letter, to refer to *Engineering* for full details given by a practical man, who appears to have devoted much attention to a very important, but hitherto much neglected, branch of engineering science?

Practically the subject is beyond my special province, which begins at the outfall of a main sewer; but it is not unnatural for the manufacturer to take an interest in the channels by which his raw material is supplied him, and Mr. Birch has hit off so exactly the points which common sense applied to the subject has led me to think have been mistaken by the majority of designers of town sewerage works, that I have great satisfaction in drawing attention to his paper.

HAMPTON WATER-SUPPLY.

(*To the Editor of the* SANITARY RECORD.)

SIR,—Since Mr. Fletcher refuses to furnish a *complete* scientific report of the water from the spring which rises in my grounds, and has elected to let his reputation rest on what he has done in the way of analyses, reports, and correspondence, I have only to leave the question, opened up by him, unanswered.

I cannot, Sir, however, conclude this correspondence without calling your attention to some manifest inaccuracies in Mr. Fletcher's report. In alluding to my spring he says it is 'in reality more polluted than two others which were pretty clearly proved to have been the cause of two attacks of English cholera.'

In the first place, his analysis gives no evidence whatever of pollution; it is incomplete and unreliable as a guide;* and, secondly, the inaccuracy of his quotation from Wanklyn (which savours of the sensational) is too glaring to be passed unnoticed. Wanklyn's words, 'supposed to have been the cause,' etc., have been changed by Mr. Fletcher to 'pretty clearly proved to have been the cause,' etc. Then, again, on the same subject, in *The Surrey Comet* of the 12th of this month, he uses the more vague expression, 'believed on good authority to have been the cause,' etc.

If Mr. Fletcher had shown more science and accuracy, and less assumption, his investigations on the water-supply of this place would have commanded some attention and respect; and I think I may venture to say, after thirty years' experience as a student of sanitary science, that neither the method nor the style of Mr. Fletcher's treatment of an important subject (if carried on as at present) *can* command either attention or respect.

Hampton, June 21, 1875. JOHN GROVE.

C. W. ROWE, milkman, at 56 Great Coram Street, was summoned for selling milk adulterated with 16 per cent. of water. Mr. Ricketts did not dispute the facts, but asked for the dismissal on the ground that the provisions of the Act had not been complied with, viz., informing the vendor of the time and place of the analysis. Mr. Bristow considered the objection fatal, and dismissed the summons.

* See Parkes's *Practical Hygiene*, Fourth Edition, p. 68, on the 'Quantitative Examination of Dissolved Solids.'

Review.

Proceedings of the Association of Municipal and Sanitary Engineers and Surveyors. Vol. I. 1873-4. Edited by the President, Mr. LEWIS ANGELL, C.E. London: Spon. 1875.

THE work under review is the first volume of the Proceedings of the above society, the history of which is embodied in the words of the preface. We are there told that engineering knowledge and sanitary science were not among the qualifications expected of the town surveyor of the last generation; but when the Public Health Act of 1848 called into existence another class of officers, these were protected by the General Board of Health, and under such auspices considerable progress was made in the sanitary condition of the country. Ten years later there followed an amendment of the Public Health Act, and the General Board of Health was also suppressed, the local surveyor being then handed over to the control of the ratepayers generally. The consequence was that, with the exception of some of the larger towns, the office of surveyor was in a manner degraded in the eyes of the profession, and was avoided, as a rule, by those whose professional knowledge would have been serviceable to the country. But after twenty-one years' operation of these Public Health Acts—viz., in 1869—the Government seemed to come to the conclusion that the results had not been altogether satisfactory, whereupon a Royal Commission was appointed to inquire into the administration of the Acts. It was at this juncture that Mr. Angell came to the conclusion that the local surveyor should have a say in the matter, and he issued a circular in February, 1871, to his colleagues in office with a result that was said to be simply astounding. Meetings were then held, and ultimately the present Association was formed, with a determination of improving and maintaining the professional position of the town surveyors and for promoting sanitary work. The society was founded in 1873; and scattered as its 153 members naturally are throughout the country, no two living in the same town, the experiment was a bold one. It is very pleasant to report that it promises to be a permanent success, thanks mainly to the spirited action taken by its chief promoter and president.

The time has undoubtedly arrived when it becomes wise for every professional class of men to have their own special society, and to issue to the world their papers in detail. The Institute of Civil Engineers, the Society of Practical Engineers, and the various associations of medical men all issue papers, which are greedily devoured by those who are anxiously studying these separate subjects, and the result must be full of benefit to the country at large. The objects of the association now before us are chiefly for the interchange among its members of that species of knowledge and practice which falls within the department of an engineer or surveyor engaged in the discharge of the duties imposed by the Public Health, Local Government, and other Sanitary Acts, and for the general promotion of the objects of sanitary science. The members consist of civil engineers and surveyors holding permanent appointments under the various urban and rural sanitary authorities within the control of the Local Government Board. The association is also formed into district committees, which include the whole of the members, each having its local secretary—at all events that is the programme set forth for the future. Following out the example set by the British Medical Association also, it is intended to hold a general meeting and conference of the Association annually in convenient centres, by which means the value of the meetings will be enhanced. The entrance fee is only one guinea, as is the annual subscription, and it is to be earnestly hoped that the engineers and surveyors now acting in the various boroughs will rally round this most meritorious society and enable it to perform all the good which has been predicted

of it. We would even go so far as to say that it is the bounden duty of all who hold appointments under the Sanitary Acts to strengthen the hands of the Association in every way within their power. For it is not more certain that addition proves multiplication than that the people generally will enormously benefit by the maintenance of the society and by the publication of its valuable memoirs. The present districts occupied by the association are the Home Counties District, the Midland District, the Lancashire and Cheshire District, and the Yorkshire District. May they each and all prosper and add influentially to their number!

We will now give a general idea of the contents of the work, as it is more than likely that many of the subjects would interest our readers so much as to induce them to purchase the book for themselves; for although the association is a close one, and limited in point of membership to borough engineers and surveyors, etc., the work can be ordered through any bookseller. The ventilation of sewers, for instance, is treated of by Mr. Ellice-Clark and Mr. Thorburn; the treatment of sewage by the President, Mr. Monson, Mr. Prange, Dr. Anderson, Colonel Jones, V.C., Professor Tanner, Major-General Scott, C.B., Mr. Bettridge and Mr. A. M. Fowler; whilst descriptions of visits are duly recorded in detail, to the Birmingham sewage works, the Leicester sewage works, and the Chester sewerage works. Records of the visits made to the Leamington, the Warwick, the Barking, and other sewage farms are also fairly recorded. An excellent paper is also contributed upon the waste of water and the constant service by Mr. Deacon. Many other equally useful articles are interspersed throughout the 260 pages.

To show the practical character of the work we subjoin an extract or two:

'The conditions of society have changed. Five hundred years ago the population of the kingdom was only equal to the present population of the metropolis. When the first census was taken, in 1801, the population of England and Wales was less than 9,000,000; it has now reached nearly 23,000,000.

'We crowd together as we never crowded before; our pursuits are more sedentary, our habits more luxurious; houses grow apace; land is more valuable, the green fields more remote; our children are reared among bricks and paving-stones. The public health can only be maintained by special sanitary appliances and precautions.

'We have improved away the open cesspool from our premises, only, in too many cases, to establish an "elongated cesspool" in our streets, a subterranean "retort" from which poison-gas is "laid on" by "services" to every house. We have ceased to pollute wells, but ventilate drains through our household cisterns. We have filled up cesspools in detail, and poisoned rivers wholesale. We have striven on every hand to hide, to bury, and to forget, but the obnoxious and irrepressible thing will come to the surface, not infrequently to strike down our loved ones, from the prince to the peasant, with its concentrated and fatal poison.

'There is yet much to be done, or we must pay the penalty of herding together and the neglect of sanitary laws. We have yet to remedy defects which are everywhere apparent, not only in the mansions of the rich and the villas of the middle class, who can help themselves, but more especially in the houses of the poor, who are dependent on others, and consequently most need our protection. We have yet to establish and promote general principles of sanitary economy in connection with the drainage, ventilation, and warming of our buildings.'

We cannot find space to review the papers methodically, because the ideas are for the most part interchanged throughout. We have, moreover, already noticed in our pages several of these papers; for instance, those of Mr. E. Monson upon the 'Sewage Difficulty' and the 'Separate System of Drainage.' We cannot, however, forbear giving an extract from the paper upon 'Sewer Ventilation,' by Mr. Thornburn, although it is but an extract from a circular issued by the Health Committee of Birkenhead.

'Where water-closets are placed within a dwelling the communication of the soil-pipe with the drain should have double traps, immediately outside the external wall of the building, with an intermediate ventilator between the traps, and the soil-pipe carried up through the roof at a point removed from the chimneys, windows, or skylights; the connecting-pipe between the water-closets, baths, and sinks being securely trapped.

'All pipes conveying waste-water from the interior of a dwelling into the drains should have their continuity broken, where practicable, and terminate over a trapped gully placed in the ground in the open air. Care should also be taken that such pipes are syphoned, so as to prevent an inward draught of air.

'Syphon or "hopper-closets" should invariably be used in preference to "pan-closets." Where pan-closets are now fixed the apparatus should be provided with efficient ventilation by means of an air-pipe extending from the top flange, at the bottom of the basin, through the external wall.

'The water-supply to all closets should be through a proper *separate and distinct* service-box, which is recommended to be provided with double valves, and in no case should such service-box be connected with, or fixed to, the cistern supplying the house with water. The water used for drinking and culinary purposes should be drawn from the service in direct communication with the water-main.

'No water-closet, to be perfectly safe, should be constructed inside a house without an intermediate vestibule, with a cross-current of air, so as to cut off the air in the house from that in the closet.'

The above information is by no means new to many of our readers, but it is very succinctly given, and cannot too often be put into type. We take leave of this volume of Transactions with great reluctance, and with most cordial well-wishing for the success of the Association of Municipal and Sanitary Engineers and Surveyors.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

BONING, Mr. Jonathan, has been re-appointed an Inspector of Nuisances for the Wycombe Rural Sanitary District.

BROWN, Mr. John, jun., has been appointed Inspector of Nuisances for the Teesdale Rural Sanitary District vice Spence, resigned.

COX, Mr. George, has been appointed Inspector of Nuisances for the Kettering Rural Sanitary District, vice Bagshaw.

COXELL, Mr. Edwin, has been appointed Inspector of Nuisances for the Lichfield Rural Sanitary District, vice Davoll, resigned.

CRONIN, Mr. John, has been appointed Collector to the Stafford Urban Sanitary Authority, vice Bagnall, resigned.

FEARON, Mr. John, the Clerk to the Cockermouth Urban Sanitary Authority, has been appointed also Surveyor and Inspector of Nuisances.

HEWSON, Mr. Joseph, has been appointed Collector to the Cockermouth Urban Sanitary Authority.

SPRIGGS, Mr. Charles, has been appointed an Inspector of Nuisances for the Wycombe Rural Sanitary District, vice Spicer, whose appointment has expired.

THOMAS, Mr. John E., has been appointed Surveyor and Inspector of Nuisances for the Newtown and Llanllwchaiarn Urban Sanitary District, vice Griffiths, whose appointment has expired.

VACANCIES.

BLACKBURN URBAN SANITARY AUTHORITY. Clerk to, and Town Clerk. Surveyor.

KINGSTON-ON-THAMES RURAL SANITARY DISTRICT. Inspector of Nuisances.

LICHFIELD URBAN SANITARY DISTRICT. Inspector of Nuisances.

PRESTON RURAL SANITARY DISTRICT. Inspector of Nuisances.

PRESTON URBAN SANITARY AUTHORITY. Clerk to, Town Clerk, and Registrar of the Borough Court of Pleas. 85*l.* per annum and fees. Application to the Town Clerk Appointment Committee.

WORCESTER RURAL SANITARY DISTRICT. Inspector of Nuisances.

SANITARY PATENTS.

2017. Improvements in the construction of filters. John Frederick Crease, Eastney, Southampton.

448. Trapping water-closets, etc. Robert Philip Pope, King's Road, Gray's Inn, London.

857. Measuring liquids, etc. Alfred Tylor, Newgate Street.

2015. Ventilating buildings, etc. Thaddeus Hyatt, Gloucester Gardens, Hyde Park, London.

2046. An improved method of, and apparatus for, treating foul or noxious gases or vapours, to prevent their contamination of the atmosphere, and to utilise them for various purposes. William Robert Lake, Southampton Buildings, London. —A communication from James Turner, Chicago, Illinois, U.S.

1880. Extracting ammonia. William Morgan-Brown, Southampton Buildings, London.

527. Ventilating ships, etc. Thomas Atkin Tippendell Lodge, St. Albans.

573. Clarifying Sewage. Samuel Hallsworth, Armley, and Richard Bailes, Woodhouse Carr, near Leeds.

575. Filtering Water. Octavius Vaughan Morgan, Kensington, and Gustav Robert Moelchaerek, Battersea.

1844. Manure. George Frederick Snelling, Edith Terrace, Victoria Road, Upton Lane, Essex.

1918. Fæcal clósets. Conway Scott, Grovefield, Down, Ireland.

ABSTRACTS OF SPECIFICATIONS.

4158. Clarifying sewage. R. Goodall, Armley.

The inventor takes common ashes, or gas lime or waste lime, and adds thereto sulphuric acid or brown oil of vitriol; he then adds water in sufficient quantity to make the mass flow along the pipes. When the impure waters contain soapy or unctuous matter the inventor uses slacked lime first, or the following mortar: say, six parts of slacked lime and one part animal carbon ground together with water, and agitates. He then adds a portion of acid mixture as above, and agitates the whole together. To prepare the sludge for re-use the inventor lifts it on to strainers and allows it to remain for a time to thicken, and then mixes in about the proportion of one-third sludge to two-thirds newly-slacked lime, and grinds the mixture, which may then be used to clarify.

4176. Artificial Manures. W. H. R. Wise, Duke Street, Adelphi.

This invention relates to the manufacture of artificial manures from various animal, mineral, and vegetable matters, and consists in the mode of treating such matters and the proportions and conditions in which they are mixed. The various matters are treated as follows:—Manure is made from blood by mixing it with sulphuric acid, soot or ashes, or both, and then drying the mixture. Manure is made from the other animal matters by treating them in a similar manner after preparing them as follows:—The softer kinds of animal and fish offal are reduced to a pulpy state by mechanical means. The fat and gelatine are separated from bones and the harder kinds of animal matter by boiling, and the residuum is then boiled under steam pressure. Instead of making the matters above enumerated into separate manures they may be combined to form one manure. In this case the prepared bones are mixed with blood to which sulphuric acid has been added; a quantity of offal is then added, and the mixture is stirred, and sulphuric acid and soot or ashes are added, and the whole is dried.

4183. Food. W. D. Stone, Oxford Terrace, Hyde Park.

The peculiarity of this invention consists in the attempt to assimilate the relative proportions of the elements and principles of certain flours and meals by mixing these flours and meals in such quantities as will render the mixture as nearly as possible of the like nature as regards the proportions of its constituents as is shown to exist in the human body. And to this end additional mineral salts are added, preferably salts of lime, which are found to be deficient in most of the cereal grains and pulses. The proportion of the constituents which the inventor has found most nourishing and agreeable is as follows:—100 lb. of his farina vitæ is composed of various flours and meals so mixed as to contain albumen, gluten, and fibrine from 15 to 18 lb., starch from 45 to 55 lb., sugar and gum from 5 lb. to 8 lb., fat from 3 lb. to 7 lb., cellulose from 5 lb. to 12 lb., and mineral salts containing phosphates from 4 lb. to 6 lb. When this mixture is required to be kept it is dried for some hours, preferably at a low heat. And for the purpose of reducing the trouble of constantly stirring the food during its culinary preparation for eating, he has found great advantage in simmering the food in a cooking utensil similar in its action to a common glue-pot or bain-marie.

4247. Sewer-pipes and treating sewage. J. C. Morrell, Leyland.

The object of this invention is to facilitate and to secure advantages which will promote the adoption of a double system of sewers in the drainage of towns, and which will further reduce to the minimum the difficulties of dealing with sewage waters. The improvement consists in constructing a special form of pipes having two compartments for the liquids to flow through, in the connection by tubes or shafts of these two compartments as well as the connection in the same way of any double system of drains for flushing purposes; also in the fixing of ventilating-shafts to same; also in the special means provided for more effectually gathering the subsoil drainage-water; and further in the modes of cleansing sewage-water by special arrangements for intermittent filtration through natural soil.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer —not necessarily for publication.

PAYMENT FOR REGISTRARS' RETURNS.

F. H., Kings Norton, inquires whether the sanitary boards (rural) have the power to pay the registrars of births and deaths for a return of births as well as deaths, and in what manner. The auditor in his district has disallowed the item for births, as being illegal. Should I be justified in paying for them myself? Would it be right in my position as medical officer of health, this course having been suggested to me by the board?

[We think that according to the strict letter of the law the auditor was right in disallowing the charges as to entries of births. We cannot understand what possible objection, however, there can be to the suggestion alluded to at the end of our Correspondent's letter.]

AVERAGE OF LIFE.

A RETURN recently made by the Registrar-General, in compliance with an order of the House of Lords, shows the average age at death among different classes in the healthy county of Rutland on the one hand, and on the other hand in the Superintendent-Registrar's district of Liverpool, of Manchester, and of Salford, all of which three have a high death-rate. The classes distinguished in the return are (1) the gentry and professional persons and their families; (2) tradesmen, etc., and their families; and (3) labourers, mechanics, and servants, and their families. The return extends over the thirteen years 1861-73. The deaths in that period in the first class, among the gentry, occurred at ages which give an average of 48·1 years in Rutland, but only 46·1 in Salford, 44·6 in Manchester, and 45·6 in Liverpool. The difference is not very great; but in the second class—the tradesman class—the ages at death in Rutland show an average of 44·4 years, but only 29·6 in Liverpool, 28·9 in Manchester, and 29·7 in Salford. Among the third class, labourers, etc., the ages at death averaged thirty-six years in Rutland, but only 23·4 in Liverpool, 24·4 in Manchester, and 22·4 in Salford. It appears, then, that in the county of Rutland the tradesmen class average at death an age not greatly below that of the gentry, but the labouring class only three-fourths of that age; but in the three towns the tradesmen class average only about two-thirds, and the labouring class not much more than half the age of the gentry. In the towns the average age of the labouring class at death, and also of the tradespeople class, is only about two-thirds of the same class in the county of Rutland. Another part of the return shows how many of the deaths were of children, how many of young persons, and how many of adults; and here we see how, in the three towns, the excessive loss of life in infancy brings down the average age at death. Taking 1873, the last year in the series, we find that in the towns no less than 8,394 of the 19,117 deaths—that is, nearly 44 per cent.—were of children under five years of age; but in the county of Rutland only 129 of the 417 deaths, or less than 31 per cent. In the towns more than 21 per cent. of the deaths were from zymotic diseases, but in Rutland less than half that ratio; and in the towns nearly 74 per cent. of the deaths from zymotic diseases were of children under five, but in Rutland only 55 per cent. The return states the expenditure on drainage and water-supply in the three towns, and it may save trouble if we mention that the return is entitled 'Drainage, etc.'

Communications have been received from:

Mr. J. Bell, London; Mr. G. F. Chambers, Eastbourne; Dr. T. J. Denton, Bridlington; Dr. F. T. Bond, Gloucester; Dr. J. Macpherson, London; Mr. N. A. Humphreys, London; Mr. N. A. Hartley, London; Mr. G. F. Heath, Hackney; Mr. G. W. Wigner, London; Dr. David Page, Kendal; Mr. F. J. Falvey, Tralee Lieut.-Col. A. S. Jones, Wrexham; Mr. J. T. Dexter, London; Messrs. Hogg and Co., London; Mr. J. C. Dennis, Ilfracombe; Mr. F. W. Fletcher, Hampton; Mr. T. J. Dyke, Merthyr; Dr. T. Milner Fothergill, London; Dr. T. W. Grimshaw, Dublin; Dr. C. W. Philpot, Croydon; Dr. Morgan, Manchester.

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Original Papers.

SPECIAL REPORT ON THE OUTBREAK OF SMALL-POX IN ATHENRY, 1875.

BY OUR OWN COMMISSIONER.

ATHENRY is a small town with a population of about 1,283, situated in the Athenry registration district of the Loughrea Union, in the county of Galway. The town has a station on the Midland and Great Western Railway of Ireland, at a distance of 113 miles from Dublin, fourteen miles east of the town of Galway, fifteen miles south of Tuam, and fifteen miles north-west of Loughrea. The union of Loughrea has an area of 198,832 statute acres, and a population of 26,402; the area of the Athenry district, 29,641 acres, and a population of 7,693, or 4·9 per acre. The town is eight miles from Oranmore Bay, a portion of Galway Bay. The district is drained by a small river. The general elevation of the town is from 115 to 130 feet above the sea-level. The geological structure of the district is for the most part limestone, with patches of alluvium, especially north-east of the town. Some of the alluvium approaches close to the town. The limestone of the district is plentifully covered with drift and limestone-gravel. Athenry possesses considerable antiquarian and historical interest; it is surrounded by a wall, a great portion of which is still standing, and possesses ruins of an old castle and abbey. The sanitary condition of the place is as bad as it can be. Six or seven weeks ago, there was no public water-supply, and the public supply at present consists of a single pump recently erected. Before the erection of the pump, the inhabitants had to trust to the sewage-polluted river and a few private wells of doubtful quality.

The house-accommodation in the county of Galway is generally of a poor description. According to the last census, of 45,955 families residing in the rural districts, 11,046 were housed in fourth-class accommodation, which practically means one room with one window; 1,086 of these families lived in mud cabins. The houses in Athenry are not better than those of the surrounding country. They are generally sunk below the level of the streets, with but one room, and in some instances no window, and altogether of a most wretched description. The most remarkable *street* we have ever visited—and we have been in a great many *queer* places—is River Lane in Athenry. It seems that about twenty years ago the river was diverted from its natural course and turned into a mill-course. The bed of the diverted river was seized upon by squatters, who built therein the most wretched hovels. We visited some of these, and had to reach them by walking ankle-deep in filth. There was small-pox in four of these houses at the time of our visit. The occupiers pay no rent, and cannot be removed except by closing the houses as unfit for human habitation. But then nearly all the houses in Athenry are unfit for human habitation, and the Artisans' Dwellings Act only extends to towns of 25,000 inhabitants. What, then, can be done to house the people in Athenry?

It may be said there is no sewerage worthy of the name, although at the present time an attempt is being made to drain the town. The houses have dung-heaps at the rear, and slops are usually cast into the street. A most remarkable system of excrement-disposal is in use at many of the houses, which is as follows. A quantity of heather is cut from a neighbouring bog, and heaped up against the house, generally close to the window (if there be one). Upon this heap of heather all excrement, slops, etc., are cast. The heather retains, as a sponge, most of the material cast upon it. This accumulation is carried on for about a year, and, when the spring arrives, the valuable heap is sold for manure to a neighbouring farmer. Here is a primitive method of sewage-utilisation!

State of Mortality.—It is impossible accurately to estimate the rate of mortality of the Athenry district; for, being a portion of the Loughrea Union, and the workhouse and attached hospital being situated in the town of Loughrea, many of the sick and all the paupers are removed to the latter town, and thus diminish the death-rate to a great extent, and disturb all the local elements of calculation. The health of Athenry, however, cannot be fairly measured by the health of the Loughrea union, as zymotic diseases seem to prevail to an extreme degree, and probably a large portion of the zymotic mortality of Loughrea union may be due to Athenry. The annual average rate of mortality for the Loughrea union for the past ten years has been 14·4 per 1,000 living. The highest was 19 per 1,000 in 1865, when scarlatina prevailed; last year it was only 14 per 1,000. The average rate for the whole of Ireland is 17 per 1,000; and for the western division of Ireland, 12 per 1,000, showing that the rate of mortality while less than that of Ireland, is higher than that, of the division in which the union is situated.

The zymotic death-rate of Loughrea Union is low for the past ten years, at the rate of 13·3 per 10,000 for the eight principal zymotics; the average for the whole of Ireland being 23 per 10,000, and of the western division being 16 per 10,000; so that, on the whole, the Loughrea Union compares favourably with the surrounding district so far as the principal zymotic diseases are concerned. As before stated, it would be misleading to make a calculation with regard to the mortality of the Athenry district itself.

Prevalence of Small-pox during Past Years.—With reference to this question, it is well known that Ireland was remarkably free from small-pox for many years until the great outbreak of 1871–72. There was a slight epidemic of small-pox in Ireland at the time the Compulsory Vaccination Act came into force in 1864; this soon declined, but in the year 1871 a sudden outbreak occurred. In considering the question of the prevalence of small-pox in the west of Ireland, it is absolutely necessary to consider the distribution of the disease over the whole of Ireland since vaccination became compulsory. This is shown in the following table: (*See next page.*)

An examination of the table shows that while, during the epidemic years of 1871–72, there was very little small-pox in the western registration division, yet that in this division there has been nearly always present a considerable amount of floating contagion. How did it happen that Athenry and the neighbourhood escaped small-pox so well during previous epidemics? There has not been a single death from small-pox registered in the Loughrea union since the year 1864, in which year there was but one. Athenry is in direct communication with Dublin by the Midland and Great Western Railway, which is joined at

Athenry by two other lines, one running northward to Tuam, the other southward to Ennis, yet it escaped during the small-pox epidemic which swept Dublin in 1871–72. Not only did Athenry escape the 1871–72 epidemic, but the whole of the centre and west of Ireland was but slightly visited, although in hourly communication with the great centre of disease in Dublin. It seems as if the epidemic virus of 1871–72 had not been able to penetrate beyond the counties bordering the east and south-east coasts of Ireland. On looking at the table of the distribution of small-pox here given, it will be seen that the epidemic virus of 1871–72 completely subsided in the north-eastern district. The disease kept moving from town to town, a great centre of contagion being maintained in Belfast by the smouldering embers of the epidemic of 1871-72, and by fresh importations from Scotland. Thus the disease was directly imported into Armagh,

Distribution of Small-pox in Ireland from the Year 1864 *to* 1874, *both years inclusive.*

	REGISTRATION DIVISIONS.								
	a North-East.	*b* North-West.	*c* East.	*d* North Midland.	*e* South Midland.	*f* West.	*g* South-East.	*h* South-West.	Total.
1864	318	110	96	82	45	96	32	75	854
1865	111	53	84	34	18	108	26	27	461
1866	31	2	80	4	6	57	4	10	194
1867	0	0	4	1	0	11	0	5	21
1868	3	0	4	0	0	11	2	3	23
1869	5	3	1	1	0	9	0	1	20
1870	24	0	1	1	0	2	2	2	32
1871	299	3	314	11	4	9	18	7	665
1872	309	9	1,714	25	38	19	63	1,071	3,248
1873	125	27	35	24	2	0	18	250	481
1874	207	150	9	5	3	157	8	1	540
Total	1,432	357	2,342	188	116	479	173	1,452	6,539
Estimated Average Population.	1,117,604	505,542	808,492	543,614	482,056	794,540	476,220	832,901	5,605,672
Small-pox Deaths per 10,000.	12·8	7·0	28·9	3·5	2·2	6·0	3·6	17·5	11·6

a. Includes Belfast. *b*. Includes Londonderry. *c*. Includes Dublin. *h*. Includes Cork—in all of which towns small-pox was epidemic in 1871 or 1872.

Ballymena, Belfast, Dungannon, Larne, Lisburne, Magherafelt, and Newtownards, from Scotland. The north-western district also escaped the epidemic of 1871-72, only a few cases having occurred, but there was a further development of the disease in 1873, which in 1874 became a serious epidemic, having its centre at Londonderry, and becoming gradually diffused over the county of Donegal, falling with special severity on the town of Donegal itself, where the disease is pretty generally known to have been further promoted by inoculation, as also at Glenties, in the same county. Until the second quarter of the year 1874, small-pox had been absent from the western division of Ireland. In the second quarter the disease appeared at Castlebar, Swinford, and Tobercurry in the county of Mayo, in each of which places it is reported to have been introduced by inoculators from the towns in the north-west division, where the disease then prevailed. The table of deaths from small-pox given in the next column shows its distribution and gradual diffusion in the western division.

It is thus clear that the disease has been gradually diffused over the west of Ireland during the past twelve months, and that the present outbreak at Athenry is part of this epidemic. The disease in the first quarter of the present year had established itself at Tuam, distant only fifteen miles by rail from Athenry, and therefore there was ample opportunity for Athenry being attacked through the ordinary channels of contagion.

The disease gradually spreads from Belfast to the north-west, and seems to have made its way through the counties of Donegal, Fermanagh, Roscommon, and Mayo, to its present position. It may thus be stated with a great degree of certainty, that the Athenry epidemic of this year, is a continuation of the epidemic of 1871-72. The contagion having taken an irregular south-westerly course from Belfast, instead of a direct westerly course from Dublin, as might have been anticipated.

	1874.				1875.
	First Quarter.	Second Quarter.	Third Quarter.	Fourth Quarter.	First Quarter.
Ballina . .	—	—	—	5	13
Ballenrole .	—	—	3	5	12
Boyle . . .	—	—	—	—	1
Castlebar . .	—	2	8	24	54
Castlerea . .	—	—	7	—	6
Claremorris .	—	—	—	10	30
Dunmore West	—	—	—	2	1
Glenamaddy .	—	—	—	—	1
Newport . .	—	—	—	—	1
Oughterard .	—	—	—	—	2
Swinford . .	—	6	17	53	43
Tobercurry .	—	3	5	6	36
Tuam . . .	—	—	1	—	19
Westport . .	—	—	—	—	1

Although this view will explain how the disease may have reached Athenry through the usual channels of contagion, it does not explain the greater prevalence of small-pox in the western than in the other rural division of Ireland, namely, the two mid-

land districts. This seems only explicable by either the neglect of vaccination, or the prevalence of inoculation; subjects which we will now consider.

Vaccination.—The efficiency of vaccination in the Loughrea Union, and the Athenry district, may be estimated by the following statement:

It will thus be seen that, as compared with the registered births, the vaccination has been plentiful but very irregular, and, in consequence of the irregularity, many persons may have escaped who otherwise might have been vaccinated under a more regular system. It is probable these afforded food for the present epidemic. The sudden increase of vaccination in 1870 and 1872 was owing to alarms about small-pox; the first to its appearance in England, the second to the outbreak in Dublin. The large number of vaccinations up to the present date in this year is manifestly owing to the alarm caused by the outbreak at Tuam; not only have 283 persons born since 1864 been vaccinated or revaccinated this year, but also 119 persons advanced in life, so that the total number of cases vaccinated already this year is 402. There can be no doubt that this extensive vaccination has done much to mitigate the present epidemic.

Inoculation.—We have been unable to hear of any case of inoculation in Athenry, but there seems to be a general impression that inoculation has been practised. Inoculation has been known to be practised at Donegal and Glenties in the north-eastern division, and at Castlebar, Swinford, Tobercurry, and Ballinrobe, in the western division.

At the Sligo County Assizes, held at Sligo on July 2, a man was convicted and sentenced to five years' penal servitude for the manslaughter of a child by inoculating him with small-pox virus, at the village of Roon in December last. The evidence of the mother was to the effect that she took her two children to a particular house; she left the two children in the house, where they were inoculated by the prisoner. The mother returned before the operation was complete, and hence was able to give direct evidence against the prisoner. The boy died in fourteen days after the operation. Dr. Bradshaw, who attended the poor child, proved the case to be one of small-pox. We are informed that, in other cases, the child to be inoculated is blindfolded and left in a place by itself with a fee of a shilling or half a crown; the inoculator then comes, and, unseen by anyone, performs the operation and takes away the money.

The following statement was made about a week ago to Dr. Burke, the medical superintendent at the General Registry Office, to whom we are indebted for this as well as for much of the other valuable information contained in this report.

'A man is said to have earned no less than 17*l.* by inoculating children in the vicinity of Ballyharris. Frequently a child vaccinated in the morning is inoculated in the course of the day, no fresh cut being made. A half-crown is placed on a stone adjoining the house, nobody sees it placed there, and no one sees it taken away. It is impossible to get any evidence against the inoculators, even the priests have failed. My informant states that the only means of checking the practice of inoculation would be by making the parents amenable.'

The Present Outbreak at Athenry.—On March 1 of the present year, a man, aged eighteen, unvaccinated, a native of Tyaquin, a place distant seven miles from Athenry, caught small-pox at Tuam, where he was working. He was admitted into the hospital at Tuam, but was persuaded by a friend, a baker (who we are happy to say was prosecuted and fined by the Tuam magistrates), that he would be better at home, and induced by this baker to leave the hospital. He was conducted by the baker to the railway station, and bundled in a carriage with other people to Athenry. On arrival at Athenry he was too ill to immediately proceed to his home at Tyaquin; he therefore went to a public-house to get warmed and rested; he remained here for some time and then proceeded to Tyaquin, when he quickly got worse and died. When dying, he was attended by the Roman Catholic curate of Athenry, who resided at a hotel in the town. The curate caught small-pox, and died at the hotel on March 17. A waiter at the hotel kept a house in the town; small-pox broke out here, and from thence disease quickly diffused through the town.

Immediately on the announcement of the outbreak of the disease, the guardians of the Loughrea Union, being the sanitary authority of Athenry, purchased an iron hospital to accommodate twelve patients, but no one could be induced to grant a site for the building. A patient was sent to the Loughrea Union Hospital, but this created such a panic in that town, that, on an attempt being made to send the hospital ambulance to Athenry for another case, a mob attacked the ambulance and turned it in the market-place, thus effectually interrupting the communications. In any case, it was manifestly improper to convey patients suffering from a contagious fever to such a distance into an uninfected locality. After considerable difficulty and delay, and whilst the disease was still spreading in Athenry, a private house in an isolated place within the old town wall was obtained, and opened on May 12, as a temporary hospital. The building not being sufficient, a shed was erected adjacent to the house, and accommodation was thus obtained for about forty beds. At the time of our visit, there were twenty-five beds standing and occupied; most of the patients were convalescent, and many of them up and out about the extremely airy and pleasant grounds which surround the building. The space allotted to each patient is quite insufficient; and, but for the very plentiful supply of air obtained by constantly open windows, the overcrowding would be extremely dangerous. This, however, was almost unavoidable under the circumstances. The hospital ambulance consists of a covered car drawn by a donkey.

We are bound to state that, considering the difficulties to be combatted, the hospitals have been wonderfully got up, and must have done an incalculable amount of good. We visited the institution with Dr. Leonard, under whose charge all the small-pox patients in Athenry have been; and we take this opportunity of testifying to his kindness and energy. In fact, everyone is loud in the praises of the 'Doctor's' kindness and zeal in the discharge of his very arduous and disagreeable duties.

The number of cases treated in hospital up to the present time has been fifty-six, of whom ten died. Those treated outside the hospital, 150, of whom twenty-eight died, making a total of 206 cases, with thirty-eight deaths, in a population of about 1,500. The rate of mortality of those attacked has been 18·4. The number of cases has been at the rate of 7·2 per 100 of the population, and the mortality up to the present has been 25·4 per 1,000 of the popula-

tion. We have not been able to obtain detailed statistics of the disease, but such numbers as we give are critically exact.

The measures taken to prevent the spread of the disease have been, to a great extent, provided by voluntary effort.

A relief committee was organised, which, besides relieving the wants of the sick, has done a great deal of valuable sanitary work. The committee supplies clothing and bedding in the place of that used by infected persons. The infected clothing and bedding are all destroyed. We have not been able to find that anything has been done in the way of disinfecting infected houses further than the supply of materials for solutionalising. There is, in fact, no efficient sanitary supervision in the town.

A great deal of distress has been caused by this epidemic, not so much from 'the sickness' itself as from the dread of the disease in the surrounding country and neighbouring towns and villages. The poorer people were all, previous to the epidemic, employed by the farmers in the surrounding country; but owing to a wholesome dread of the disease, the farmers will not employ any one residing in Athenry, hence nearly all the labouring classes have been thrown out of employment, and have to be supported by private charity or the public rates.

The shopkeepers also have suffered much, as their usual customers in the surrounding country have ceased to deal with them, and obtain all their supplies from the towns at a greater distance. The determination of the people in the surrounding districts to cut off communications has done much to prevent the spread of disease. The parish church, which is situated in the town, is quite deserted, and its large congregation has for some weeks been reduced to half-a-dozen worshippers. We have arrived at the following conclusions.

1. That the epidemic of small-pox now existing in Athenry is a portion of an epidemic which has spread over the north and west of Ireland.

2. That the spread of the disease in the west of Ireland has been much accelerated by inoculation.

3. That the disease was directly introduced into Athenry on March 1, and became diffused after March 17.

4. That the chief cause of the diffusion of the disease in Athenry was the want of hospital accommodation, which was not provided until two months after the outbreak of the disease.

5. That the sanitary condition of Athenry is such as to favour the spread of any zymotic disease.

6. That the epidemic cannot be attributed to any general neglect of vaccination, although there appears to have been less attention to vaccination in some years than there should have been.

7. That vaccination has been very effectual in protecting those vaccinated from the effects of the small-pox contagion.

We trust this Athenry epidemic will be a lesson not only to the Loughrea sanitary authority, but also to all other rural sanitary authorities. Firstly, to keep their districts in a sanitary condition; secondly, to enforce vigorously the Vaccination Acts; thirdly, to encourage vaccination; and, lastly, to provide sufficient hospital accommodation near at hand, and always ready for the admission of the first cases of contagious zymotics.

We have often advocated the establishment of cottage hospitals in small towns and villages; and if a cottage hospital had existed in Athenry, it would probably have saved the district from a great portion of the present outbreak, and consequently saved the ratepayers' pockets, and prevented the great loss and injury which the town has suffered.

The religious service is now held in the Protestant church during the continuance of the epidemic. The sitting of the petty sessions has also very properly been suspended for a time.

The vaccination returns in Loughrea union for the year 1871 were 727, for 1872, 712. No returns for the year 1874 have yet been issued.

TOWN MILK: ITS USES AND DANGERS.*

LET us take a morning stroll with a city milkman. We are 'early astir,' for Tom Whey has scores of houses to call at in his wide walk, and the very early milk-train has brought up in great tin cans his country supply, gathered from two or three farms in a rural solitude, where the cows nip the fresh pasture rich with the smiling buttercup, and fragrant with meadow-sweet and cowslip, far away from the smoke of the great city. He is an honest man in his way, at least for the age he lives in, and he believes in his commodity; at least he has dealt lightly with it, and with his hand on his heart would repel indignantly any imputation as to aqueous dilution. This may be literally true, for the addition process had been effected at the rural solitude, and if he had erred at all it was in the way of the subtraction, by a deft manipulation, of some of the oleaginous constituents, by which the proportions would be slightly altered from the natural state. However, to all appearance his article is of fair quality, and has a good reputation, and in good faith he shoulders his cans, and, turning into the next street, he commences his cry of 'Milk!' Observe how his customers run, one door after another, first on one side of the street and then on the other; then he picks out one here and another there; then great gaps; and the further he goes from his shop the more scattered his clients become. His cart supplies the more distant purchasers in the great city. He confides to us with a dejected air that his friend Farmer Curds, down in Bucks or up in Lanarkshire, as the case may be, who supplies him with milk, has a house full of sick folk, and is in a bad way himself. We bid him good morning. Indeed, a great calamity has fallen upon that farmhouse in the rural solitude.

Three children have been ill for a fortnight; one died yesterday; the farmer has taken to his bed, and the busy housewife is distracted with the cares of nursing the sick and milking the cows. A short way from a reeking dunghill stands the pump, a drain is stopped, and the slops thrown on the ill-paved, ill-kept yard are being washed by the falling rain into the well, and that water they all esteemed so pure and bright contains now a zymotic poison.

Take up again the trail of the milk-carrier in the great city, not at once, but in a fortnight or three weeks, and if you have chalked the doors of the customers in his walk you will find illness, not in

* *Typhoid Fever: Its Cause and Prevention. Illustrated by the Recent Epidemics in Crosshill and Eaglesham.* By Eben Duncan, M.D., Fellow of the Faculty of Physicians and Surgeons, Glasgow, etc. James Maclehose, Glasgow.

every house, but perhaps in half of them. Tom, when he called 'Milk,' had put down a dose of typhoid poison at every doorstep.

This is the gist of the tale that has been told in other language, and in sober earnestness, by several medical observers; and is substantially the story worked out in a very masterly manner by Dr. Eben. Duncan in the pamphlet under our notice. This report gives the result of his personal experience and of his inquiries concerning the causation of an epidemic of typhoid fever, which prevailed, during the early part of the present year, in Crosshill, in the neighbourhood of Glasgow; and it constitutes the record of the latest example of the propagation of fever by the milk-supply.

Since the first revelation on this subject, in 1858, by Dr. Michael Taylor, of Penrith, 'On the Communication of the Infection of Fever by Ingesta,' it is impossible to say how many instances may have passed unnoticed of the diffusion of zymotic poison through the medium of milk. The facts were comprehensively stated, and the inferences against the milk-supply were argued out with great pains by Dr. Taylor, but his observations stood alone for several years; and there is no record of a similar incident until August, 1870, when Dr. Taylor narrated to the profession a series of bad scarlatina cases emanating also from a dairy. About the same time a similar outbreak of scarlatina, propagated in the same manner, was noted by Dr. Oswald Bell, of St. Andrews, and also the Islington epidemic of typhoid, which was traced out with so much skill and mastership by Dr. Ballard. Since then, almost every year has brought forth additional examples; so that this explosion along the milk-walk at Crosshill constitutes, we believe, in point of time, the tenth instance of the occurrence which has been carefully investigated and recorded.

About half a mile to the south of the city boundary of Glasgow a new suburb has sprung up within the last fifteen years. Building operations have gone on so rapidly that the district so formed contains now a population of 14,000. One of the portions of this suburb is called Crosshill, and this, and an adjoining place, which is called, for want of a better name, 'No Man's Land,' formed almost exclusively the sphere-ground of the epidemic the origin and progress of which was the subject of Dr. Eben Duncan's investigation. These two places contain 6,000 inhabitants, mostly of the middle class, and in comfortable circumstances; but it must be borne in mind that many of the streets and terraces consist of houses from three to four stories in height, rented in flats, as is common in towns in Scotland, so that there are often from six to eight families in one tenement.

Crosshill is built on a stratum of clay, has been well drained and sewered, is on an elevated level, and enjoys a reputation of salubrity and freedom from city smoke and gases. In fact, for the three years preceding 1875 the average death-rate of the burgh of Crosshill and the parish in which it is situated has been remarkably low; it has been seventeen per thousand. The average death-rate for the city of Glasgow during the same period has been 30 per 1,000.

During the year 1874 no death from typhoid fever occurred in the burgh of Crosshill. From January 18 till April 20, 1875, eleven deaths occurred in the burgh from typhoid, and in all twenty-four deaths happened within the same period in connection with the epidemic as a whole. Dr. Duncan calculated that from January 18, the date at which he fixes the commencement of the epidemic, till March 31, when it came to an end, there had occurred 280 cases of typhoid fever in Crosshill and its neighbourhood. Such an outbreak as this in a community apparently so well situated in a sanitary point of view was most unexpected, and its causes demanded inquiry. Practising in the district, a considerable proportion of the cases came under the care of Dr. Eben Duncan, and as a local medical practitioner interested in the circumstances he instituted an investigation as to the causes of this explosion of typhoid, and that apparently without the vantage-ground of an official position and authority to surmount those obstructions created by trading and social interests, by which such inquiries are apt to be beset. He received, however, all desired information and assistance from the local boards and their inspectors, and at a later period of the epidemic the suspicions excited in his mind as to the causation of the disease were verified by Dr. Littlejohn, the medical adviser of the Board of Supervision, who was sent to make an official inspection.

Dr. Eben Duncan has shown much energy, caution, acumen, and tact in the working out of this problem, as evinced by the pamphlet before us; there has been untiring industry in collecting the minutest details, and marked sagacity in linking together the chain of evidence; so that, step by step, the inquiry became narrowed by the process of exclusion, so that, almost by the force of a demonstration, we accept his conclusion as the correct one.

First. The nature of the soil was considered. Reference is made to the views of Pettenkoffer, as to the influence of the rise and fall of ground-water in porous soils; but the stratum on which Crosshill is built is a stiff clay, impermeable to air and water, and Dr. Duncan held that no such endemic influence existed here. Second. Atmospheric conditions at the time of the outbreak had no special part either in the origin or in the propagation of the disease. Third. The sewerage system, though not free from defects, was absolved as a factor in disseminating the contagion. Fourth. No blame could be attached to the water-supply. Fifth. In the ten weeks during which the epidemic may be said to have lasted, sixty-eight cases of fever came under the immediate care of Dr. Duncan; and in the following table which he has given it will be observed, that they are grouped so as to indicate apparently two epidemics, the cause of which afterwards appears:

FIRST EPIDEMIC.

	Cases.
January 18 till January 24 inclusive	6
,, 25 ,, 31 ,,	3
February 1 till February 5 inclusive	2
No cases from February 5 till February 15.	

SECOND EPIDEMIC.

	Cases.
February 15 till February 21 inclusive	13
,, 22 ,, 28 ,,	16
March 1 till March 7 inclusive	18
,, 8 ,, 14 ,,	2
,, 15 ,, 21 ,,	4
,, 22 ,, 28 ,,	4
	68

Finding no other speculation as to the cause of the outbreak tenable, and on comparing notes with other medical men practising in the neighbourhood,

in whose *clientèle* numerous cases were also occurring, the theory arose to Dr. Duncan, that the zymotic poison might have its origin and was being propagated by a polluted milk-supply. Inquiries were accordingly instituted as to the particular dairies from whence the infected families procured their milk. It would appear that there were several dairymen in Crosshill and neighbourhood with whom these families dealt, which dairies may be designated by the letters of the alphabet A, B, C, D, etc. The sources from whence the first four named milk-vendors drew their supply of milk were from some farms at a village called Eaglesham, and principally from two farms which may be designated by the letters X and Z. The sixty-eight patients attended by Dr. Duncan were supplied as follows:

	Dairy A.	Dairy B.	Dairy C.	Dairy D.	Dairy E.
68	35	14	11	4	4

It will be seen from this that in sixty-four cases in his practice the milk-supply could be traced to the Eaglesham dairies; the four who did not get it from thence were smitten late in the epidemic, and had been visiting and drinking in infected houses. The total number of families in the burgh of Crosshill supplied from the Eaglesham dairies was 262, and out of these families ninety-four were affected with typhoid fever.

From these and additional facts and tables adduced by Dr. Duncan it will be seen, that there was an extraordinary connection between the distribution of the Eaglesham milk and the spread of the disease, a connection so remarkable that it could not be a mere coincidence, but must have borne the relation of cause and effect. If it were true that there was typhoid contagion in the milk sent out by the four milk-vendors at Crosshill, it is clear that it must have got into the milk either before it left Eaglesham or subsequently. No source of evil nor defects in sanitary arrangements could be proved against the four shops at Crosshill where the milk was received. But what had been going on previous to this time in the village of Eaglesham? Typhoid fever had been introduced there in the autumn, had spread, and had broken out as an epidemic so severely in November and December, that in a small cluster of houses thirty-three cases had occurred up to the end of the latter month. The plan and survey given of the tenements and Dr. Duncan's description show how probable it was that this epidemic was propagated by the water-supply from a well in dangerous proximity to the drainage of these houses; he also shows, that the overflow from these premises found its way into a watercourse, which at a distance of 800 yards formed the principal source of water-supply of the farmer, X, whose milk was being sold in the Eaglesham dairies in Crosshill. The family of Farmer X began themselves to suffer from the effects of this poisoned water: about the end of January two of the children were down in typhoid fever. 'When these children were confined to bed they lay for several days in the little bedroom opening into the kitchen; the kitchen opened into the dairy.' Here was ample opportunity for that fouling of the milk by the direct emanations from the sick, or by the absorption of the fever miasmata generated on the premises. This is the manner in which contagion got into the milk in the epidemics described by Dr. Taylor at Penrith, by Dr. Robinson at Leeds, and by Dr. Russel at Parkhead, Glasgow; so that it is not always necessary to presuppose that there have been accidental or intentional additions of water. In other instances and in this at Eaglesham, however, the well-water was seriously contaminated, and the presumption is strong that some of it may have got into the milk-vessels. The conservation of the purity of the milk-supply at its spring-head in country dairies, which sell milk to the public, is a subject not only of local but of such national importance, as to authorise measures by which to ensure official supervision and inspection by local sanitary authorities in rural districts.

THE
SANITARY RECORD.
SATURDAY, JULY 10, 1875.

TO SECRETARIES OF SANITARY ASSOCIATIONS AND KINDRED SOCIETIES.

The Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers read before the members of any sanitary or kindred association.

THE RIVERS POLLUTION BILL.

IT will be in the recollection of our readers that a week or two ago Lord Salisbury announced in the House of Lords that it was intended to proceed with the Rivers Pollution Bill in a modified and shortened form, in order that the chances of doing something on the subject this session might not be imperilled by trying to do too much.

The bill, as amended, has not only been reprinted but considered in committee in the House of Lords. And we now propose to present some notes on its present form, so far as we have been able to tack on the alterations made in committee.

Every person is to be deemed guilty of an offence against the Act who conveys the solid refuse of any manufacturing process, or any rubbish, cinders, or other waste or putrid solid matters, into a stream, so as (either singly or in combination with similar acts on the part of the same or any other person) to interfere with its natural flow, or pollute its waters.

Every person is to be deemed guilty of an offence against the Act who conveys into any stream through or by any sewer or channel any solid or liquid sewage matter. But this prohibition is subject to an important proviso as follows:—'Where matter of the same description was conveyed to the stream through the same sewer or channel during January 1875, no proceedings are to be taken against the offender until after December 31, 1876; and such person is not to be deemed guilty of an offence so long as he is using the best practicable and available means to purify the sewage matter before it is conveyed into the stream.

Every person is to be deemed guilty of an offence

against the Act who conveys into any stream through or by any sewer or channel any poisonous, filthy, noxious, or polluted liquid proceeding from a manufacturing process or a mine. This prohibition also is the subject of an important proviso as follows: Where liquid matter of the same description was conveyed to the stream through the same sewer or channel at any time during 1875 no proceedings are to be taken against the offender until after December 31, 1877. Nor even then, unless such proceedings are authorised by an order of the Privy Council.

Every sanitary or local authority controlling sewers is to give facilities to manufacturers for the admission into sewers of poisonous, filthy, noxious or polluting waste liquids. Forms and conditions (including, if needs be, compensation) are to be settled by agreement, or, in default of agreement, by arbitration. Any liquids carried into sewers in pursuance of this section are, for the purposes of the Act, to be deemed included under the term 'sewage matter.' A local authority may refuse to receive poisonous liquids until they are rendered harmless, or any heated liquids, or any filthy, noxious or polluting liquids, except upon such terms as will compensate the local authority for any additional expense they may be put to in dealing with their sewage matter in consequence of the introduction of such liquids.

These are the important pollution clauses of the bill, but it contains sundry enactments relating to legal proceeding and business details connected with the working of the bill, a notice of which we must, however, defer for another week.

Notes of the Week.

THE Select Committee on the Hampstead Hospital question will hold the first meeting on the 9th inst. Mr. Sclater-Booth, president of the Local Government Board, has been elected chairman.

THE Thames Floating Swimming Bath was opened during the week, on the river, near Hungerford Bridge. It has a constant supply of clean filtered water at the rate of 500 gallons per minute, the depth of the bath varying from three to seven feet.

FEVER IN THE BOROUGH OF BECCLES.

THE Mayor and Town Council of the borough of Beccles, Suffolk, have ordered the school board and other schools of the town to be temporarily closed in consequence of an outbreak of fever. The town of Beccles is a municipal borough and a local board district, which had in 1871 a population of 4,844 persons.

ALLEGED BUTTER ADULTERATION.

IN the Lambeth Police Court there has been a conviction for selling butter alleged to have been adulterated with palm oil. The reason which the analyst is reported to have given for the opinion that the sample was not genuine butter was that it yielded 94 per cent. of fatty acids, whilst butter yielded 84 to 85 per cent. We cannot regard the case as having been satisfactorily proved.

THE COST OF FEVER PATIENTS.

AT a recent meeting of the Leeds Board of Guardians, a letter from the secretary of the Leeds House of Recovery, or Fever Hospital, was read, informing the board that in consequence of the increasing cost of maintaining that institution the charge per day for each patient had been raised from 1*s.* 9*d.* to 2*s.* 6*d.* A similar increase in the charge for maintenance of patients in the small-pox hospital at Birmingham has been recently decided upon.

CONDITION OF MILLBANK PRISONERS.

DR. MUNRO, of Millbank Prison, in giving evidence as to the cause of death of one of the prisoners, stated, in reply to the question of a juryman, that 'the average number of prisoners confined is about 1,200, and, taking the last three years, the general mortality would not exceed ten per 1,000. The atmospheric condition of the prison was now very good, and the water-supply greatly improved.' This is certainly a low death-rate, and speaks volumes in favour of an efficient system of sanitation.

POPULATION OF THE LARGE TOWNS.

THE Registrar-General makes the following estimate of the population of our great towns in the middle of the year 1875, calculated on the assumption that the present rate of increase is the same as that which the census shows to have prevailed in the ten years 1861–71 : London (the 'registration division'), 3,445,160 ; Glasgow, 534,564 ; Liverpool, 516,063 ; Manchester, 356,626, and Salford, 135,720, making together 492,346 ; Birmingham, 366,325 ; Dublin, 314,666 ; Leeds, 285,118 ; Sheffield, 267,881 ; Edinburgh, 211,626 ; Bristol, 196,186 ; Bradford, 168,305 ; Newcastle-upon-Tyne, 137,665 ; Hull, 133,932 ; Portsmouth, 122,632 ; Brighton, 111,089 ; Leicester, 109,830 ; Sunderland, 106,342 ; Nottingham, 92,251 ; Oldham, 87,437 ; Norwich, 82,842 ; Wolverhampton, 71,718.

WAKEFIELD AND ITS SUBURBS.

AT the last monthly meeting of the Wakefield Rural Sanitary Authority, a discussion which is locally described as 'long and rather warm,' took place with regard to the sanitary condition of Sandal, a suburb of Wakefield, which is acknowledged to have been very unsatisfactory for several years. It was stated that the surveyor to the sanitary authority was ordered some time since to prepare plans of the district, and it is now promised that these plans shall be laid before the authority on August 25, to which day the further discussion of the subject was adjourned. It appears from the last published quarterly return of the Registrar-General that the death-rate in and around Wakefield was exceedingly high during the first quarter of this year. Scarlatina, whooping-cough, enteric fever, and diarrhœa were fatally prevalent, and the death-rate in the district from the seven principal zymotic diseases was equal to 7·8 per 1,000 ; in the Sandal sub-district eleven deaths resulted from scarlatina, four from enteric fever, and seven from other zymotic diseases. The evidence of unsatisfactory sanitary condition is patent enough. The Wakefield Rural Sanitary Authority re-appointed Mr. W. Dyson Wood medical officer of health to the authority, at a salary of 100*l.* per annum.

SMALL-POX SPREAD BY PAPER-RAGS.

THIS cause of the spread of disease has been hitherto unnoticed ; it appears, however, to be not unimportant to the public health.

DR. F. B. A. Lewis relates, in the *Boston Medical and Surgical Journal*, June 3, the particulars of some remarkable cases of small-pox occurring in girls engaged in sorting rags.

Three cases were attacked with a rapidly fatal result. Cases of fairly marked small-pox followed the fore-

going, and were communicated to others residing in the same houses, especially to infants; and in no cases did vaccination appear to prevent. One person well pitted from small-pox was attacked and died.

These cases are supposed to have been caused by exposure to twenty bales of rags, which were brought from California; ten bales having been received January 28, and ten February 5. These rags were sorted by twenty-one girls in one large room, seven of whom were attacked at about the same date. The superintendent of the room stated to the writer that these rags were moist, had a peculiarly disagreeable odour, and many bandages, poultices, and some entire articles of underwear, stained as though from the persons of invalids, were found.

Dr. Lewis observed that the vessel bringing these rags to New York city was not quarantined, that the bales were stored with many others which were forwarded to the mills of another county, and although made into paper no complaint was entered. Some of the employees here who actually handled the rags were not affected, while others working in other material on the opposite side of the room succumbed to the disease; and even two or three who were in other parts of the mill, but who came into the assorting room upon an errand, took the disease. About forty cases have occurred in all, and thirteen or fourteen have died. The mortality was mostly confined to those first attacked.

This attack has appeared to be very irregular or mixed. Had the cases been attended by a single physician, and the fact that all the patients had been employed in a paper mill been known, possibly the disease might have been suspected earlier.

A somewhat similar outbreak of small-pox occurred in England, at Hereford, from a parcel of old clothes which had belonged to an infected patient, and were sold to a marine-store dealer.

FOOD FOR THE BRAIN.

A NEW YORK letter reports that, a short time ago, a certain Dr. Lambert read a paper before the Liberal Club on the 'Special Articles of Food adapted to the Nutrition of the Brain, and the Methods of Cooking them.' Preparatory to this he invited some of his friends to a banquet, which is thus taken off by one of the daily papers: 'Last evening a party of gentlemen ate a 'brainial' dinner at Jones's restaurant, in Broadway, their host being Dr. T. S. Lambert. Mr. James Parton and about twenty others, more or less well known, sat around the board and nourished their brains to a somewhat alarming extent. The waiters grinned from ear to ear when they served the food, for not one of them had ever dreamed of a dinner beginning with toasted crackers and cheese and ending with boiled custard and buttermilk. The 'brainial' qualities of toasted cheese have long been known to scientific men, and nearly all the members of the Liberal Club are passionately fond of boiled custard, which, as is well known, contains over 90 per cent. of phosphorus, and will readily burn if rum be poured over it. Dr. Lambert lectures to-night on 'Brain Building,' and it was to raise the intellects of his audience to a high place that he gave this exhibition of encephalotropophagy, or brainial food. Such a dinner will do occasionally, but is dangerous if too often indulged in. The human brain is about 80 per cent. water, and if it be stuffed with the sublimations of cheese, oysters, codfish, tripe, calves' brains, oat groats, and boiled custard, it becomes a powerful battery, a perilous magazine, liable at any moment to explode, to the great detriment of its owner and the surprise of bystanders. By the time the sixth course, which consisted of stewed tripe and green peas, was reached, the excitement became fearfully intense, and with the calves' brains the feast became almost an orgie. The forehead of the Pantarch grew four inches higher with the great pressure from within upon the convolutions, but happily the ganglion where oatmeal becomes universology was not affected in any marked degree. The parietal bones of a great Comtist separated, and the coronal suture widened quite perceptibly. Around the brow of a mighty spiritualist there was a marked nimbus, where the escaping phosphorus ignited upon coming in contact with the oxygen of the air. It was singular in the extreme to watch the oatmeal rising to the brain; to see the subtle poison of the boiled custard turn a man into a demon of ratiocination; and as the fiery buttermilk mounted to the intellect and hurled the reason reeling from its throne, the beholder was fain to acknowledge that the gods are just, and of our pleasant vices make instruments to plague us.'

EDUCATION OF DEAF MUTES.

A VIENNA correspondent writes that an opportunity was recently afforded by the kindness of Professor Gruber of visiting the Jewish institute for the education of deaf-mutes for Austria. This school has been in operation for the last fifteen years, and is so highly appreciated that during the school year 1873-4 upwards of fifty applications for admission had to be refused from want of accommodation. Payment is taken from parents whose means allow of their making them.

In a report by Herr J. Deutsch, the director, it is mentioned that according to a census taken in 1869 the proportion of deaf-mutes in the Austro-Hungarian Empire was 9·7 to 10,000 inhabitants. This gives for the Jewish population 1,032 of whom nearly 300 would be between the ages of seven and twelve.

In North America, the director adds, the proportion of deaf-mutes in the white population is only 2·3 per 10,000 of population; or not quite one-fourth of the Austro-Hungarian rate.

The records of this Vienna school for fifteen years show that 23·3 per cent. (about one-fourth) of the pupils received were children of marriages between relations within the forbidden degrees. The number of male deaf-mute births is said to be greater than of females in about the proportion of three to two.

On the occasion of our visit there were ninety-nine children, about two-thirds boys. These are divided into six classes. In the first or lowest class the children are taught to pronounce, or articulate vowels and syllables by imitating the position of the lips, teeth, and tongue of their teacher. The printed characters which represent the sounds taught are at the same time shown; and pictures are also used to illustrate words as cat, dog, tree, house, etc. A language phonetically written like German must be more easily learnt than English where the same printed letters have at different times a varied pronunciation.

The tone of the scholars in speaking is monotonous, and each word is uttered as if by a separate effort or jerk. The tongue appears to be less under control, or rather to be less educated than in healthy persons. Speech is in many rather thick and indistinct. The letters S and T are frequently confused. The deaf children attend, may indeed be said to listen, with their eyes.

The more advanced were able to write to dictation, even when the master merely gave facial and oral expression to the words without phonation.

At the request of the director, Professor Gruber spoke a few sentences to one of the boys, and he in turn dictated to a second, who wrote upon a black board, from which a third boy afterwards read; and in the three stages the sentences were rendered with almost perfect accuracy.

Many of the pupils showed readiness and correctness in working out rather difficult sums in compound rule of three.

The course of instruction for the sixth or highest class is subjoined. (Age about twelve.)

Religion.—Essentials of the Mosaic religion, the ten commandments, the significance of the Jewish fasts and festivals, a knowledge of the Jewish calendar, Ethics with illustrative texts from the Holy Scripture.

Biblical History.—To the Kings.

Grammar.—Especially prepositions and conjunctions.

Writing.—Committing to writing descriptions, tales, and letters; also keeping of a day-book.

Reading.—The Reader in use in upper-classes of the country schools.

Arithmetic.—First four rules, decimal and vulgar fractions, rule of three and mensuration.

Geography.—Outlines of physical geography; the four quarters of the globe; the Austrian empire and a knowledge of its constitution.

History of the principal characters in Austrian history.

Natural History.—Classification. The chief mammals and birds.

Physics.—Properties of matter.

Heat.—Barometer and thermometer.

Arts.—Knowledge of different trades, illustrated by pictures.

Drawing.—Both freehand and engineering.

The girls are further taught sewing, knitting, etc.; the qualities of different kinds of materials, and also housekeeping.

The children have six hours of school daily.

There is a fairly found gymnasium where instruction is given.

The sleeping-rooms were clean, but rather overcrowded. The general nutrition of the children appeared very fair; but some showed scrofulosis. The food is excellent: we saw the dinner served—good potato soup, stewed beef with bread, and a pudding to follow.

This imitative plan of instruction, I believe, originated in America, and a single visit is enough to convince one of the benefit it confers by making useful members of society of those who would otherwise be more or less burdens, and making the patients themselves happier by giving them an interest in their surroundings and a key to admit to the otherwise closed book-world.

The Health of Watering Places.

V. DEAL AND WALMER.

THE two parishes of Deal and Walmer may fairly be taken to represent one watering-place, although so far as local government is concerned they are perfectly distinct. The parish of Deal is co-extensive with the municipal borough and the paving district of that name; and the parish of Walmer constitutes a local board district. Each parish, therefore, is under a different sanitary authority, and has its own medical officer of health. Viewed as a watering-place, however, it will be desirable to consider their vital statistics in the aggregate.

During the ten years 1861 to 1871 the population of the two watering-places increased from 10,806 to 11,825, equal to an increase of 9·2 per cent.; in Deal the increase was 6·3 per cent., whereas in Walmer it was equal to 16·5 per cent. If the same rate of increase which prevailed in the ten years 1861 to 1871 has been maintained since 1871, the population of the two parishes in the middle of the present year may be estimated at 12,287, of which probably 8,318 persons live in Deal, and 3,969 in Walmer.

In the Registrar-General's Watering-place Table the registration sub-district of Deal is taken to represent the combined place Deal and Walmer. It will be useful, therefore, to consider how far the boundaries and constitution of this sub-district differ from that of the watering-place. The sub-district of Deal had an enumerated population in 1871 of 13,114, of which 11,825 resided within the parishes of Deal and Walmer, and 1,289 in six other rural parishes. The population of these rural parishes may be taken as stationary, so that the figures for the sub-district relate to a rural population of rather less than 1,300 persons beyond those living in the parishes of Deal and Walmer. The inclusion of this small rural population probably to some slight extent affects the figures thus given for Deal and Walmer; but this disturbance is too small to destroy their value for the purpose of affording a clue to the recent sanitary condition of the watering-place.

It appears from the Registrar-General's four quarterly returns for 1874 that 349 births and 229 deaths were registered in the sub-district of Deal during that year. The births were equal to a rate of only 25·9 per 1,000 of the estimated population, against an average annual rate of 31·3 per 1,000 during the ten years 1861-70; this marked decline in the birth-rate is only here worthy of note, inasmuch as it throws some doubt upon the present estimate of population, and seems to suggest the possibility that the population of Deal and Walmer has not, since 1871, increased at the same rate that prevailed between 1861 and 1871, in which case the Registrar-General's estimate would be over-stated, and both the birth- and death-rates under-stated. During the ten years 1861-70 the average annual births recorded in Deal sub-district were 395, whereas in the four years 1871-4 they did not average more than 374. This decline in the number of births is at any rate unusual in an increasing population; nothing, however, but local investigation would satisfactorily prove whether the present population of Deal and Walmer be really over-estimated.

In calculating the death-rate for the Deal sub-district the fact that the Eastry Union Workhouse (to which the paupers from the sub-district of Deal are admitted) is situated at Eastry must not be lost sight of. In want of more definite information it may be fairly assumed that half the deaths occurring in that institution are of paupers from the Deal sub-district; it will, therefore, be necessary, on this account, to add twenty-five deaths to those registered during 1874 in Deal sub-district. With this correction for deaths in the Union workhouse the deaths in 1874 in the sub-district population may be taken as 254, and equal to a rate of 18·9 per 1,000 of the estimated population; the rate without correction for the workhouse deaths was only 17·0, against an average annual rate of 18·6 (also uncorrected) during the ten years 1861-70. The corrected death-rate in the sub-district during the four years 1871-4 has been as follows:—20·7 in 1871, 20·2 in 1872, 16·4 in 1873, and, as above stated, 18·9 in 1874. The death-rate therefore in 1874, although showing an increase upon the low rate in the previous year, was below the average rate in the ten years 1861-70, or the rates either in 1871 or 1872. It should be repeated, however, that if the present population of Deal and Walmer is over-estimated, the death-rate in recent years is somewhat under-stated.

The 254 deaths in Deal sub-district during 1874 (after correction for the workhouse deaths) included nine which were referred to measles, seven to whooping-cough, seven to diarrhœa, two to fever, two to diphtheria, one to scarlatina, and not one to small-pox; in all, twenty-eight deaths resulted from these seven principal zymotic diseases, equal to 11 per cent. of the deaths from all causes, and a rate of 2·1 per 1,000 persons estimated to be living. The average proportion of deaths from these seven diseases in England and Wales in 1874 was 16 per cent., and the death-rate was 3·6 per 1,000. The fatality of these diseases in Deal and Walmer, in 1874, compared with that in the other watering-places previously noticed, was below the average. Of the nine deaths from measles six occurred in the March and three in the June quarters; and the whole of the seven from whooping-cough were returned in the first three months of the year. The two fatal cases of fever, the one of scarlatina, and five of the seven of diarrhœa, occurred in the September quarter; whereas in the last three months of the year two deaths were referred to diphtheria, and one to diarrhœa. With regard to these twenty-seven deaths from the principal zymotic diseases, it may be noticed that eleven were returned in Deal, nine in Walmer, and eight in the remaining rural parishes of the sub-district; the zymotic rate was equal to 1·3 per 1,000 in Deal, 2·3 in Walmer, and was so high as 6·2 in the rural parishes. The eight deaths from these diseases occurring outside Deal and Walmer included four in Great

Mongeham and four in Sholden parishes; the population of these two parishes is but about 772, the zymotic rate being not less than 10·3 per 1,000. The annual rate of mortality from diarrhœa during the third or summer quarter of 1874 was equal to 2·1 per 1,000 in Deal sub-district, and was highest in Deal parish. The diarrhœa rate, in the same period of 1874, was equal to 3·4 in Yarmouth, 4·9 in Margate, 2·7 in Ramsgate and St. Lawrence, and 3·6 both in Broadstairs and in Lowestoft. The death-rate from diarrhœa in Deal and Walmer was therefore lower than in any of the above-mentioned watering places.

Infant mortality in Deal sub-district during 1874, measured by the proportion of deaths under one year to births, was equal to 135 per 1,000, against 151, the average proportion during the year in the whole of England and Wales. Compared with the rate in other watering-places, infant mortality in 1874 was, however, high in Deal and Walmer; the forty-seven deaths of infants under one year of age included twenty-two in the first three months of the year.

The population of 13,114 enumerated in Deal sub-district in 1871 included 1,207, or 9·2 per cent., of persons aged upwards of sixty years. Assuming the proportion of persons at these ages to be constant, the number of persons living in Deal sub-district in the middle of 1874 and aged sixty years and upwards was 1,238, and the seventy-five deaths of persons at these ages during the year were therefore equal to an annual rate of 60·6 per 1,000, and 11·4 lower than the average rate in the whole of England and Wales. The death-rate among persons aged upwards of sixty years during 1874 was equal to 65·1 in Yarmouth, 62·5 in Margate, 60·0 in Ramsgate, and 56·6 in Lowestoft.

During the first quarter of this year sixty-three deaths were registered in Deal sub-district, which, together with seven deaths in the workhouse, make seventy to be debited to a population estimated at 13,580. The annual death-rate in the sub-district during the three months ending March 31 was therefore equal to 20·6 per 1,000, or 5·1 lower than the average rate in the rural population of England and Wales. The proportion of deaths of elderly persons was unusually high, the result of the long and severe winter. Only two deaths were, however, referred to the seven principal zymotic diseases; these were a fatal case each of whooping-cough and diphtheria, both returned in Deal parish.

The sanitary condition of Deal and Walmer, so far as may be judged from the foregoing examination of the vital statistics of the two parishes, affords fairly favourable comparison with that of other watering-places. The fact, however, of eleven per cent. of the deaths being referred to the principal zymotic diseases suggests that there is still room for improvement.

There is considerable difficulty in the way of estimating the sanitary condition of watering-places (which have become favourite health resorts on account of their healthy situation and fine air), for want of some trustworthy standard by which to measure the mortality. The mortality in Ramsgate, Lowestoft, and in Deal and Walmer, is low by comparison with the average rate in small town districts. The question, however, really is, how much lower ought the mortality to be and might it be made? Ten per cent. or more of deaths from zymotic diseases cannot, in such situations, be looked upon as a necessary evil. With regard to the vital statistics of Deal and Walmer, the rate of mortality among infants is undoubtedly excessive, and is not entirely beyond sanitary control. The sanitary condition, moreover, of some of the rural parishes in Deal sub-district, especially of Great Mongeham and Sholden (to which we have called attention), is a matter to which the residents of Deal and Walmer cannot afford to be indifferent. Beyond the effect of lowering the position of their watering-place in the Registrar-General's Watering-place Table, the fatality of zymotic disease in these outlying villages is decidedly detrimental to their best interests. Dr. Robinson, the medical officer of health for the Eastry Union rural sanitary authority, in his report for 1873 spoke of the 'vast amount of sanitary work waiting for accomplishment in this union.' As Deal and Walmer suffer for this neglect, it appears to be a matter for regret that the whole of the union is not combined under one sanitary authority.

There is not very much to be said of these places except that their quiet may suit those who dislike the crowd of the large watering places of the Isle of Thanet. We have known people greatly pleased with them, especially with Walmer, where they had comfortable lodgings. If there is not much stirring at Deal or Walmer, still the habits and ways of the Deal boatmen are well worth studying, and Walmer Castle, the official residence of the Warden of the Cinque Ports, is an object of interest.

We have said something of sea air and of sea-water, but there are still some minor matters about which a few words may be said before proceeding to discuss sea-bathing.

The nature of the shore is of considerable importance to bathers, and most particularly so to children; the shore may be sandy, and a crisp sand under foot is very pleasant; in some places the sands are soft, and it is a toil to get through them; in other places they are firm, and you may gallop or even drive a carriage on them. The sands of Scarborough and of Redcar are notable in this respect. A shingly beach, as at Southsea or at Dieppe, is very disagreeable, and necessitates the use of shoes in bathing, which, to most people, is unpleasant. Sometimes there is only a short belt of shingle at high water, and if you cross it you get on sand. In some few places used as bathing-stations, there is no sand at all, and the bather must avail himself of shelving rocks, but in all tolerably large places a space is usually cleared away among the rocks for the convenience of bathers. The swimmer always prefers ground where the coast shelves rapidly, or still better, where he can plunge from a rock. Sometimes there are small depressions or holes in the sands which are unpleasant, as the bather may step into them unexpectedly. Other matters are the strength of the tide, or of currents, which varies according to local circumstances. If the ground is at all dangerous, it is safer to bathe while the tide is coming in; if the bank shelves rapidly and the sea is pretty high, it is often difficult when the tide is retreating for the bather to keep his footing, as the sand is washed away from under his feet. The risk from currents applies chiefly to swimmers, who sometimes, not being aware of their existence, swim out heedlessly, and then find that the set of the current prevents their being able to reach the shore. A rope for female bathers to hang on by is usually a sufficient protection. Winds, and still more waves, have to be considered. When there is much wind, the bather should keep more in the water, and expose his body as little as possible to the wind, which deprives it so rapidly of caloric. The waves bear a certain proportion to the force of the wind, and the greater the impetus of the waves, the shorter should the period of bathing be.

A sea bath is essentially a cold or temperate medicated bath, as salt water contains from 2½ to 3½ per cent. of salts. It may be said on an average to be at least 40 to 45 degrees colder than the temperature of the body. It differs from common house baths, in the person being exposed to the open air, in the water always being in motion, usually sufficiently so to produce waves, the impetus of which gives what is called a shock.

MRS. CHANTRELL, the woman who has rendered herself notorious by keeping a large number of cats and dogs in a state of starvation at Rottingdean, near Brighton, was at the recent quarter sessions for Sussex ordered to pay the costs of the appeal, about 150*l.*, and to undergo the two months' imprisonment to which she was sentenced in August last.

Parliamentary Proceedings.

HOUSE OF LORDS.

(Friday, July 2.)

RIVERS POLLUTION BILL.

THE Pollution of Rivers Bill was considered in Committee, after some preliminary remarks from Lord Airlie, who thought that all the alterations which had been introduced into the measure would not have much effect in removing the difficulties surrounding the subject.

On clause 3, relating to the conveyance of sewage into streams, objection was taken to the enormous powers which would be conferred on local authorities; and, after some discussion, Lord Granville recommended that the clause should be omitted, but on a division it was agreed to by 85 to 45.

On clause 4, relating to liquid pollution from any manufacturing process or from any mine,

Lord Salisbury explained, in reply to Lord Carlingford, who said he had understood that the altered bill was not intended to deal with pollution arising from manufactuing and mining operations, that the object of the clause was to enact that no new pollution from such sources should be introduced into streams. Existing interests would be dealt with next year.

The clause, slightly amended, was agreed to, as were also the remaining clauses of the bill.

(Monday, July 5.)

SALE OF FOOD AND DRUGS BILL.

ON the report of the amendments on this bill.

Lord Egerton of Tatton moved the omission of the word 'knowingly' from clause 3, his contention being that the act would be otherwise inoperative. Very positive and precise proof would be required to prove that a man had knowingly adulterated the article which he offered for sale.

Lord Aberdare supported the amendment.

The Duke of Richmond confessed that since the bill had passed through committee he had received a great many communications on this subject. These communications had led him to reconsider the conclusion at which he had formerly arrived. He had accordingly determined when the bill came on for third reading to bring up a clause to meet the object sought to be obtained by the amendment just submitted. There were difficulties in the way of doing it off-hand or he would have had no objection. What he should himself propose would be to give the vendor of any article the power of proving before a magistrate that be had no guilty knowledge of any deleterious mixture being contained in the article when he sold it.

On clause 6, which provides for the sale of compounded articles of food and compounded drugs.

Lord Penzance pointed out that as the bill at present stood many opportunities would be afforded for evading its provisions. As the clause was framed, traders would be allowed to adulterate articles with harmless mixtures provided these mixtures would improve their 'portable or palatable' qualities, render them more easy of preservation, or improve their appearance. What he should propose was that in all cases where an article of any kind was mixed with a harmless substance for any of the purposes enumerated, the mixture should be distinctly specified on the label. Coffee, for instance, was often mixed with chicory, and bread with alum. Many people thought these articles were improved by the mixture, but most people thought the reverse, and it would be well if those who bought either should have the opportunity of clearly knowing what they actually bought.

The Duke of Richmond observed that there were some substances which could be made 'portable' otherwise than by putting a handle to them. Ether, he understood, would not be portable unless mixed with some other substance; and there were probably other articles of a similar description. It would be very difficult to do without the word 'preserving,' because lard, butter, and other things could not be kept without salt being mixed with them. As to the term 'palatable,' there was the article of chocolate, which no one would eat unless sugar were mixed with it. There, however, could be no doubt that clause 5 did not run well with clause 7, and therefore, keeping in view the suggestions of the noble lord, he would, upon the third reading, see whether any amendment could be introduced to carry them out.

Earl Fortescue urged the importance of preventing drugs being mixed with other substances, because their strength would thereby be altered.

Lord Penzance thought that if tradesmen were allowed to mix the articles they sold, they should state the fact in some definite form for the protection of the purchaser.

The Marquis of Salisbury thought that a good deal of difficulty would arise in reference to honey, drugs, and articles with which it was necessary to mix salt.

Lord Penzance said that where salt was mixed as a condiment, or where other articles were known to be prepared in a particular way, the purchaser really got the thing he bargained for.

The amendment was withdrawn.

Lord Redesdale, on clause 7, thought that the provision that the word 'mixed' should be placed upon certain articles would not be sufficient, and he moved an amendment to the effect that there should be a statement of what was mixed with the article, and in what proportions, so that the purchaser should know what he bought.

After a short discussion the amendment was negatived.

PUBLIC HEALTH BILL.

ON the motion for going into committee on this bill,

The Earl of Camperdown rose to call attention to the water-supply of the metropolis. He thought that the ratepayers of the metropolis would have to pay an enormous amount of money in consequence of the action of the Metropolitan Water Companies in connection with the working of the statute under which the metropolis was revalued from time to time. On each revaluation, both the gross and the rateable value of property in this capital was largely increased. That, he ventured to think, would be found to be a result of the recent revaluation. The Water Companies made their charges on the rateable value of the premises; so that, with the increase of the value of property in the metropolis, those companies could bring large additional sums into their coffers without extending their works or improving either the quantity or quality of the water. They could do this until their dividends reached 10 per cent. Since the Metropolis Valuation Act of 1871 came in force those Water Companies had raised their capital from 9,975,000*l.* to 11,071,000*l.* Their plan of raising money was by the issue of additional shares, instead of by loans, which they could obtain at a moderate rate of interest. Their shares were readily taken up, because persons knew that when the time came, as come it would, when a central authority would have to purchase the rights of those companies, the purchase would have to be made at a very high rate on a very much increased revenue. It might be difficult to insert in this bill a clause to protect the ratepayers against the Water Companies, but he suggested that the Government might well consider whether the operation of any new valuation of the metropolis ought not to be suspended for a year or two, in order that Parliament might have an opportunity of considering what ought to be done in respect of those companies.

The Duke of Richmond declined to follow the noble earl, inasmuch as by a clause in the bill the metropolis was expressly excluded from the operation of the measure.

Their lordships then went into committee on the bill,

and clauses up to 110 were agreed to. In clause 110, prohibiting in populous districts the carrying out of certain manufactures and processes injurious to health,

The Duke of Northumberland moved an amendment having for its object to bring within the clause the smelting or burning of ores or minerals giving off sulphurous acid, sulphuretted hydrogen, or ammoniacal gases.

The Duke of Richmond opposed the amendment, which was lost in division, and the clause was added to the bill, as were also clauses 113 to 123, inclusive.

On clause 124,

The Duke of Somerset moved the insertion of words which would have the effect of bringing under the operation of the bill persons who, suffering from contagious disorders, wilfully communicated such disorders to other persons.

The Duke of Richmond said he was unable to accept the amendment, and remarked that it had not been thought advisable to deal with contagious diseases in the present bill.

The proposal, which was supported by Lord Hampton, was negatived without a division, and the clause was added to the bill, as were also clauses 125 to 167, inclusive.

The Earl of Morley moved the insertion of a clause giving the urban authority power to provide a place for public meetings.

The Duke of Richmond said the proposed clause had been rejected by the House of Commons on the ground that it would interfere with local taxation, and he did not think it would be seemly under these circumstances to reinsert it in the bill.

This amendment was negatived, and clauses up to 238 were agreed to.

The remaining clauses were also agreed to, and the bill passed through committee.

HOUSE OF COMMONS.

(Friday, July 2.)

PHYSICAL EDUCATION.

MR. BUTLER-JOHNSTONE called the attention of the house to the desirability of introducing physical education in the public elementary schools of the country. The hon. member observed that physical education was as necessary as the teaching of reading, writing, and arithmetic. Among every thousand persons who presented themselves for enlistment in the army 408 were rejected on account of some malformation, and out of 5,500 boys who had wished to enlist in the navy, more than 50 per cent. were rejected on physical grounds, while of 358 children in metropolitan suburban workhouses, who were visited by an eminent physician, 23 per cent. were found to be suffering from chronic diseases. By 'physical education' he meant the inculcation of some elementary knowledge of the laws of health and hygiene, and also the practice of certain simple but scientifically devised exercises, founded on sound anatomical laws. The hon. member then referred to the adoption and carrying out of physical education in Sweden, Germany, Italy, and Russia, and the advantages which had arisen from that cause. His object was, he said, to extend the advantages of such education to the crowded streets and alleys in large towns, and he would urge upon the Government the importance, especially in a manufacturing country like this, of introducing physical education into elementary schools.

VALUATION OF METROPOLITAN PROPERTY.

MR. SCLATER-BOOTH, in answer to Mr. Hubbard, said he was not aware of any general increase in the valuation of property in the metropolis, though he knew that an increase had been complained of in many localities. The cause of the increase was that the time had now arrived when a revaluation had to be made. This valuation would not come into effect until April 5 of the next year, and in the meantime all parties feeling themselves aggrieved would have an opportunity of appealing to the assessment committee and afterwards to the assessment sessions. No instructions had been issued with respect to the new valuation of the Local Government Board.

CATAPULTS IN THE STREETS.

MR. CROSS, in reply to Colonel Leigh, stated that the use of catapults was regulated by 2nd and 3rd Vic., c. 27, and also by the Police Act. There was no power to prohibit their sale, but their use in the streets or the royal parks was an offence within the meaning of the Act cited.

LOANS TO LOCAL BOARDS.

MR. W. H. SMITH, Secretary to the Treasury, has laid before the House of Commons a return which, coupled with other returns made in 1873 and 1874, shows upwards of 83,000,000*l.* owing by the local authorities of England and Wales in respect of loans made to them. Mr. Smith's returns states that since 1869 the Metropolitan Board of Works have raised from the public 7,826,000*l.* at 3½ per cent. The borrowings of the Mersey Docks and Harbour authority have been very large. The returns show 1,757 local authorities indebted in various sums borrowed. Their annual accounts are made up at different dates, and it can only be said that these statements of their debts are the amounts shown at various periods 'in 1873-74-75, or thereabouts.'

(Monday, July 5.)

DRUGGING OF ANIMALS BILL.

THIS Bill passed through Committee *pro formâ*.

METROPOLITAN BOARD OF WORKS.

ON the motion of Mr. W. H. Smith, leave was given to bring in a Bill for further amending the Acts relating to the raising of money by the Metropolitan Board of Works, and for other purposes.

THIRD READINGS.

THE following Bills were read a third time: Local Government Board Provisional Orders Confirmation (Abingdon, Barnsley, etc.) Bill; and the Local Government Board's Poor-law Provisional Orders Confirmation (Oxford, etc.) Bill.

ARTISANS' DWELLINGS (SCOTLAND).

THE Artisans' Dwellings (Scotland) Bill was read a second time.

Law Reports.

STREET OBSTRUCTIONS.

THE Court of Queen's Bench, in the case of *Ball* v. *Ward*, has given a decision of some importance. Ball, the appellant, stationed a caravan on an open space in the town of Spalding, by leave of the commissioners, to whom he paid the customary toll for the permission accorded to him. The situation was near a public thoroughfare, though not in one; but people gathered round the caravan, and soon a concourse grew which extended to and into an adjacent street, to the inconvenience not only of foot-passengers, but of persons driving along the street. The police summoned the appellant for creating an obstruction, under section 28 of the Towns Police Clauses Act, 1847, and the magistrates convicted; but the Superior Court held that even if there was an obstruction, which the police could deal with, the appellant was too remotely responsible for it to be properly convicted under the Act cited, and accordingly they quashed the conviction.

INTEREST IN CONTRACTS.

AN important case under the Municipal Corporation Act has been decided in the County Court, Bradford. Mr. Thornton, a member of the town council, was proceeded against by Mr. Hope, architect, for having acted as councillor while disqualified from so doing by reason of his having an interest in certain profits and employments under the corporation. Mr. Thornton is a contractor, and it was proved that he had received payments for allowing the corporation to deposit rubbish on land belonging to him. The judge held that the defendant was disqualified from being elected last November, and inflicted a penalty of 50*l.*

WATER RIGHTS.

THE House of Lords, on June 15, had before it the case of the *Swindon Waterworks Company* v. *Wilts and Berks Canal Company*. This was an appeal by the Waterworks Company against a decision of the Lords Justices, restraining them from using the water of a certain spring so as to injure the canal, the complaint being that the Waterworks Company had diverted into their reservoir the waters of two springs. V. C. Malins had dismissed the bill, but the Lords Justices held that the Canal Company had long ago become riparian proprietors, and had acquired a right to the water under their Act, and they therefore granted an injunction to restrain the defendants from diverting the water so as to injure the canal. Their lordships dismissed the appeal with costs.

UNDESIRABLE OYSTERS.

BAD oysters are worse than no oysters at all, and these 'delicacies' become indelicacies when they are offered for sale in such a condition that nobody can eat them except at the risk of life, and oyster-dealers appear to be unaware that they are liable to a separate penalty for each unwholesome oyster. A gentle hint to this effect has been given to an oyster-dealer at Manchester, who has been summoned for having exposed for sale a number of oysters unfit for human food. According to the evidence of an inspector, a retail dealer purchased a quantity of oysters, which were found to be so bad that the purchaser returned them, and received back his money. The inspector's attention being called to the circumstance, he visited the defendant's stall on the following day, and found 1,010 oysters all bad. The magistrate said that the defendant had rendered himself liable to a penalty of 20*l.* for each oyster, or 20,200*l.* in all. This penalty was, however, reduced to 5*l.*, and A. Howard may congratulate himself on being let off at a very reasonable rate, for as he might have poisoned 1,010 persons by his oysters, a penalty of 20,200*l.* would not have been heavier than he deserved.

A BUTTER CASE.

AT the Lambeth Police-court, John Hawkins, chandler, carrying on business in Hill Street, Peckham, appeared to a summons for selling butter as unadulterated which was adulterated. Samuel Fisher, one of the inspectors appointed for the parish of Camberwell, stated that, on June 9, he sent to the defendant's shop for a quarter of a pound of butter. He afterwards told him that the butter would be tested. Dr. Bernays, of St. Thomas's Hospital, said he examined the butter bought at defendant's shop. From its appearance he doubted if it were butter at all. The fatty acids, after careful examination, were found to be 94 per cent., whilst in genuine butter it was but 84 or 85 per cent. It was adulterated with fat very largely, other than butter, which was the smallest constituent. The water in it was much below what was found in genuine butter. He believed the butter was mixed with palm oil. There was a large quantity of such kind of butter being sold, and it was thought the subject ought to be brought before the Court, though there was nothing deleterious in the mixture. Mr. Lushington asked if the mixture might be as good as butter. Dr. Bernays said it might be so. The defendant said he had sold the butter just as he bought it, and he supposed it was genuine. Mr. Lushington told him that he had his remedy against those from whom he purchased it. It was clear that he had sold an article for butter which was not butter. Those like defendant were bound to sell genuine articles. He fined him 5*s.* and 12*s.* 6*d.* costs.

INUNDATIONS OF MARSH LANDS.

MR. JUSTICE DENMAN tried at the late assizes the case of *Woodard* v. *Browne*, one which involved numerous questions as to the rights of owners of marsh lands not within a commission of sewers to protection from inundations caused by the sea. The plaintiff owned Kerseymarsh Farm, about fifty acres of which lie below high-water mark, and are protected from the waters of Benfleet Creek, by a sea-wall. Adjoining the plaintiff's farm on the east is a farm belonging to the Enfield Charity, and on the west of the plaintiff's farm is Reeds Hill Farm, the property of the defendant. These lands were all, on March 20, 1874, flooded to a depth of about three feet, which at some points came over and at others broke through the sea-wall. The plaintiff sued the defendant for not repairing his sea-wall, and now called witnesses to prove that the water came in over and through the walls belonging to the Enfield Charity and to the plaintiff before any water came over or through the plaintiff's own wall, and that the water which came over his wall was inconsiderable. The destruction of a crop of wheat and oats on the plaintiff's lands, and great injury to his grass-land, caused by the salt water resting there for a week were also proved. Mr. Murphy, for the defendant, submitted that there was no duty imposed on the defendant to keep up his wall; that, if there was any duty, it was only to use reasonable care in maintaining his wall; that the tide on March 20, 1874, was the highest known, and one the defendant was not to be expected to guard against; and that no part of such damage could be assigned to the water that came from the defendant's wall. Numerous witnesses were called for the defendant, who differed from the plaintiff's witnesses as to the times at which the breaches occurred, and as to the extent to which the water came over the walls of the respective properties, and at the rising of the Court the further hearing of the case was adjourned.

DEFAULT BY AN OWNER.

MR. A. J. COOK, Fonnereau Road, Ipswich, has been charged with allowing a nuisance to exist on his premises in Purplet Street. The inspector of nuisances said he had found some open soil pits there which gave a very offensive smell. They were filled with liquid manure. When there was a heavy rain the water ran in and there was such a smell that people had to shut their doors and windows. There was a temporary trough round the privies and the rain water ran down the wall and so went through the brickwork into the bins.—The medical officer of health said he was of opinion that the odour from the bins was prejudicial to health. The water ran into the bins, fermentation took place, and then very obnoxious gases were emitted. He saw the premises last year and found them in a very bad condition.—Mr. Cook said he was not liable to be summoned. It had been held by the bench eight years ago, when he was summoned, that the person causing the nuisance should be liable. The nuisance was the act of the tenant. He had had two soil bins covered over, and they had become more nuisance than those left open. The sanitary authority did not do its duty. The soil should be removed by a proper staff of men, but it was not done. They were depending upon farmers coming into the town to empty the soil bins, and they only came when it suited them. The covered bins were more nuisance than otherwise, as the farmers when they sent to take the soil out of the bins only took it out

of those that were uncovered where the soil could be easily got at.—Mr. Orford said that there was a defect in the structure of the soil bins, and therefore the owner of them was the one to be summoned. With reference to the sanitary authority, they had had the soil bins belonging to the defendant emptied several times. He asked the magistrates to have the defects remedied in a month. He did not see that the ratepayers should be taxed to pay the medical officer of health for coming to give evidence against people who wilfully let a nuisance exist, and he therefore asked the magistrates to include in the costs a fee for the medical officer. It was no part of his duty to come and give evidence.—The magistrates ordered the defendant to abate the nuisance in a month. The costs were 9*s.* 6*d.*, and 10*s.* 6*d.* was allowed for the medical officer.

IMPORTANT QUESTION AS TO ENTRY BY AN INSPECTOR OF NUISANCES.

THE case of *Small* v. *Bickley*, recently heard by the Court of Queen's Bench, was a conviction of a butcher, under the Nuisance Act, 26 and 27 Vict., cap. 117, for obstructing an inspector from entering his premises to search for diseased meat. The inspector having heard that on a Saturday night the defendant had sold a piece of bad meat went to the defendant's house on Sunday, and desired to enter and search the shop, which was locked. The defendant said he should not allow him, would not give him the key, and refused to facilitate his entrance, and as he kept the key the inspector could not enter without breaking the door, which he did not think proper to do. He accordingly summoned the defendant. The Act provides that the inspector may enter premises where meat is sold at any reasonable time, and at all times where business is being carried on, without notice, and imposed a penalty for preventing, impeding, and obstructing the officer in his entry and search. The magistrates convicted the defendant and stated a 'case.' The conviction was impugned on two grounds—that the demand to enter was not at a 'reasonable time,' as it was on a Sunday and at a time when business was not being carried on, and that the defendant did not obstruct or prevent the inspector from entering, as he merely refused to open his shop. Mr. Justice Blackburn observed that the reasonableness of the time was for the magistrates to determine, unless a search on Sunday could not possibly be lawful and reasonable. But then, said the judge, an uncharitable magistrate may have believed, from the refusal of the defendant to open his shop to the inspector, that there was something there he did not wish the inspector to see, and which by Monday morning might have been removed. At all events, the magistrates have found that the demand to enter was at a reasonable time, and it can hardly be said that under no circumstances could a search on Sunday be lawful. The Lord Chief Justice observed that the stronger objection appeared to be that, in fact, the defendant did not obstruct the officer, because all he did was to decline to facilitate entrance, and the officer, as the Act gave him power to enter, might have broken open the door to enable him to enter. As to this, however, Mr. Justice Blackburn observed that the inspector might have doubted whether the law authorised him to force the door. It was argued that this doubt was justifiable, because it was only in cases of felony that an outer door could be broken open on a Sunday, and there was here no express power to break open doors. The Court held that as there were no words in the enactment making the party liable to a penalty for not letting the officer in, and the defendant did no act to obstruct him, it was not an offence, and they, therefore, reversed the conviction, observing that the Act required to be altered.

BY-LAWS FOR HOP-PICKERS.

SIR,—Has the Local Government Board prescribed any draft form of by-laws to regulate the lodgings and treatment of hop-pickers under the Act of 1874? P. Q.

[No, we believe not; but we consider that the said board ought to do so; and this remark applies not simply to the subject of hop-pickers, but to every by-law subject. It will be quite impossible ever to secure anything like reasonable uniformity of law or usage so long as 800 urban sanitary authorities are allowed the option of putting into force 800 sets of local by-laws. Granting that a little latitude must be allowed for local circumstances, there is ten times as much latitude in regard to by-laws as there ought to be.]

ESTABLISHMENT OF FEVER HOSPITALS.

HAS an urban sanitary authority power under any of the Sanitary Acts, or under any other Act (if so, under what section or sections), to prevent the establishment of a fever hospital, say, for example, in the middle of a town or on its very borders?

If no such power exists, is it not desirable that the Government should be requested to make provision for such power in the Public Health Bill now passing through Parliament? JUSTITIA.

[No: apparently not. The only available remedy seems to be by indictment for a nuisance; and having regard to the decisions in previous cases it is doubtful whether the proceeding would be successful]

Correspondence.

THE HAMPTON WATER-SUPPLY.

(*To the Editor of the* SANITARY RECORD.)

SIR,—I have not the time, nor has the SANITARY RECORD space, to devote to mere personal recrimination.

Had your correspondent, Mr. Grove, produced one shred of evidence, in opposition to any statement of mine respecting the Hampton water-supply—had he brought forward an analysis of his spring water,* made by another chemist, or even given you a detailed account of his own examination, so triumphantly referred to in his former letter—I should have been most ready to meet any objection he had to offer. But when, 'after thirty years' experience as a student of sanitary science,' he is found declaring that the ammonia method of water analysis 'gives no evidence whatever of pollution,' and that 'it is incomplete and unreliable as a guide,' he places himself beyond the reach of any argument I might hope to address to him, inasmuch as he could have no difficulty in likewise disputing the proposition that two and two make four. I must, therefore, content myself by wishing him all the happiness which he can possibly extract from the belief that twice two are five, and that Wanklyn and Chapman's process is a delusion and a snare. FREDERICK W. FLETCHER, F.C.S.

Hampton, June 28, 1875.

[This correspondence must now close.]

STORM-WATER AND SEWAGE.

(*To the Editor of the* SANITARY RECORD.)

SIR,—Will you allow me a few lines in reply to Lieut.-Col. Jones's letter upon 'Storm-Water and Sewage.' He is under some misapprehension with regard to our arrangements. We admit and we do not admit storm-waters. That is, the larger proportion of storm-waters are excluded from our sewers by intention, but a portion are not excluded in fact. The area which supplies the sewage for our farm is a very extended one; we have nearly 100 miles of streets and roads, and from 6,000 to 7,000 acres of land more or less intersected by drains. The drains are pipe

* It may be as well to disclaim any personal motive in publishing the analysis of this water, by stating that until the appearance of Mr. Grove's first letter, I had not the remotest idea that the spring was in any way connected with him or his grounds. All that concerned me was that the water discharged itself along the highway, that it was a public supply, and impure.

drains, which are not laid so as to be water-tight at the joints, the result is that immediately after heavy rains the subsoil drainage finds its way into our sewers and dilutes our sewage to a considerable extent. This will continue in the future; it is a small evil. I do not think it is necessary to alter it, because I believe in diluted sewage. Secondly, I think it would be wrong to exclude street washings from sewers in thickly populated districts. When, in some distant future, streets are paved with impervious material, are swept daily, and the *débris* which is constantly deposited is as constantly removed, then the storm-waters from our streets may be allowed to go into the nearest watercourse; but at present, when rain descends heavily after a few weeks' dry weather, the street washings are, if anything, more impure than our ordinary sewage. We must purify this street sewage before it goes into our watercourses, and its natural destination is the farm. It carries with it much silica in a highly comminuted state, some potass capable of being acted upon by the phosphoric acid in ordinary sewage, and other materials useful in agriculture. When, therefore, a farm can be commanded by gravitation, there is no good reason for excluding it from the sewers. The manager of the Croydon farm has to deal with it, and do the best he can with it. We arrange to have ordinary grass-land always ready for the reception of our storm-waters, especially for the second purification of the effluent after it has been on rye-grass; whilst we allow them rest in fine weather.

Col. Jones and your readers will see, therefore, that in an extended area like the district of Croydon 'the separate system,' in its entirety, is an impossibility. Whenever, in the course of time, we find, from an extension of road-making and increase of building area, storm-waters are concentrating to a particular spot without much contamination, we turn those into the proper watercourse. We have expended 5,000*l.* during the past year for that purpose; but we shall never obtain a separate system, as it is supposed to be, by those who have no practical knowledge of the difficulties attendant upon the proper drainage of a district and the nature of town-sewage. It has been shown by the river-pollution commissioners that the sewage of towns which do not admit fæcal matter into their sewers has the same chemical composition with those which do admit it.

Towns which can deal with the sewage by gravitation need have no difficulty on the score of storm-waters. Those towns which have to pump their sewage will do well to exclude subsoil-drainage from their pipe-sewers by rendering them more impervious than can be done with the ordinary clay-joints. I endeavoured to persuade our local board in 1866 to insist upon concrete in certain cases, but could not carry my resolution. They now begin to think it would be wiser than using ordinary clay, but even concrete is not enough.

In conclusion allow me to suggest to Colonel Jones and other ardent sanitarians like him, that in the consideration of the arrangements necessary for the proper drainage of an extended area there are many things to be considered besides the convenience of the farm manager, and whilst thanking him for the energy with which he pursues his subject to remind him that districts must necessarily differ.

As regards the balance-sheet of the farm it is really published every year by the local board of health; but as it is a receipt and expenditure account only, and takes no account of the difference between annual expenses and those sums of money which have been sunk in what are termed unexhausted improvements, it will be some years before the proper balance can be struck and the real value of town sewage shown in an indisputable balance-sheet. My own impression is that it will be ultimately seen that as far as Croydon is concerned, a rate of one penny in the pound will have to be borne to provide for its disposal.

ALFRED CARPENTER, M.D.

Croydon, July 2, 1875.

RURAL SANITARY PRIZE ESSAY.

(*To the Editor of the* SANITARY RECORD.)

SIR,—Will you kindly allow me through the columns of your journal to acknowledge the receipt of essays bearing the following mottos.

'Ἄριστον μεν ὕδωρ.'—'Vitavi culpam non laudem mereri.'—'Paulatim.'—'Waste not, want not.'—'Caberfeidh.'—'Opiferque per orbem dicor.'—'When people are sick, physicians cure them; they are the menders of torn garments, etc.'—'Health is wealth.'—'There is an antidote for every poison.'—'Spero meliora.'—'La Valetta.'—'Sanitas sanitatum omnia sanitas.'—'Plympton.'—'Crux.'—'Prayer and labour.'

Four essays have been sent without mottos, the receipt of which cannot be further acknowledged.

LORY MARSH.

June 30, 1875.

'A LIVERPOOL SUBURB.'

(*To the Editor of the* SANITARY RECORD.)

SIR,—My attention has been directed to an article in your last Saturday's issue, under the above heading, with respect to the death-rate of Huyton-cum-Roby.

At the present time the sanitary affairs of Huyton-cum-Roby, the suburb above alluded to, are conducted by a parochial committee, appointed by the rural sanitary authority under the Public Health Act of 1872.

In the year 1873 the inhabitants of Huyton adopted the Local Government Act, 1858, with the view of carrying out a scheme of sewerage, which is so much needed. This, however, required the sanction of the Local Government Board, in London. Before the ratepayers could obtain this sanction, some of the large landowners, with Lord Derby at their head, petitioned the Board in London, and offered strenuous opposition; the result being that the Board refused their consent, and the action of the ratepayers became a dead letter.

This will account for the present condition of the suburb as depicted in the *Liverpool Courier* and the SANITARY RECORD.

The ratepayers have been thwarted instead of encouraged in their project to carry out a scheme of sewerage, and the township is in the same condition now as it was in 1873, when Mr. Arnold Taylor, the Government inspector, described 'the ditches in the place choked with sewage matter.' Who is to blame?

JOHN PEARSON.

Oak House, Huyton Park (South).

Reviews.

Effets et Influence de la Musique sur la Santé et sur la Maladie. Par le Docteur H. CHOMET. Paris: 1874.

DR. CHOMET is a sanguine man. Thirty years ago he proposed to enlighten the Academy of Sciences at Paris concerning the effects of music on sick people—the Academy neglected its opportunity. The proposal fell flat, as he tells us, in consequence of the Revolution. Then came the *coup d'état*; then the death of the only member of the Academy interested in Dr. Chomet.

Still, faith in his work buoyed up the Doctor, and at last—re-written, and most unfortunately swollen—out came the neglected essay, with a little French preface, quite beaming and blushing all over with a sense of conscious merit.

Had Dr. Chomet no misgivings? None! The Academy would not hear—the world must now decide.

We confess that we opened this neat volume of 250 pages with the greatest eagerness. We, too, had long been thinking over the undoubtedly strange physical influence of sound—and especially musical sound—upon the animal organism. Here, then, was a man who had made this his especial study. Will it be believed that out of 250 pages, 207 are occupied by a vast rambling discussion about music in every other connexion except in that with disease, and that out of eight chapters only the two last have any real bearing upon the seductive title of the book?

Still, with all our hopes aglow and with every desire to praise, we began to wade through a preparatory history of all music, and we are bound to say that this part of the work is without value, inaccurate, slovenly, and mischievous.

The different countries are early hit off in a few lines. But how? 'Calm, phlegmatic, and dreamy,' as applied to German music, is neither true nor untrue—it is simply the language of a man who does not know what he is talking about. We might just as well describe Turner's pictures generally as 'noble, suave, and umbrageous.' What does it mean? Why, it means nothing; we do not require an Academy of Science to tell us that.

Then we get the usual vague shots at the origin of music, and we find ourselves bumped backwards and forwards between a Chinese legend, a Pythagorean myth, and a sentiment from J. J. Rousseau, till, after skimming a long and windy discussion about Greek and ancient music generally, we at last touch land with Ambrose—date only wrong by about ten years. And here we have just another example of what runs all through the book. When Dr. Chomet quotes other people's opinions he evidently only half understands them, and when he gives his own he is generally wrong; hence that curiously inexact sort of statement which is the certain mark of loose, ill-digested, second-hand information. Nothing which he says is quite true about either Ambrose or Gregory, or, in fact, anyone else, although it would take more space than it is worth to show how untrue it all is. St. Ambrose, for instance, never was Pope at all, as Dr. Chomet implies, but merely Bishop of Milan. So far from the Greek modes impeding modern music in its early stages—as they certainly did in its later ones—the eight scales, selected by Ambrose, were essential to the development of any music at all. So far from Gregory selecting out of the profusion of chants and melodies which had grown out of St. Ambrose's work, St. Ambrose's work had been nearly forgotten in Gregory's time, his labours almost lost, chanting itself fallen into disuse; so that Pope Gregory had the greatest difficulty in recovering the remnants of Ambrose's system, and putting a few of the old chants together again, cutting out of them the undiatonic intervals which Ambrose had adopted from the pure Greek chant.

Anything more ridiculous than the talk (p. 60) about the benighted condition of the Church during the dark ages can hardly be imagined. Why, the Church was about the only thing that was not benighted; and most people know, as indeed Dr. Chomet himself admits elsewhere, that instead of the Church retarding musical progress and the popular art of the Trouvères advancing it, that art itself must infallibly have died had not the Church invented the science of writing it down and reducing its wild and irregular impulses to order. But Dr. Chomet only exhibits his critical faculty in all its captivating nudity when he comes to discourse upon Beethoven, Mendelssohn, and Rossini. After touching oft Beethoven in exactly ten lines as a composer, chiefly remarkable for 'throwing us into vague emotions full of sweetness and seduction!' (*risum teneatis?*) he goes on to announce to the world in eight pages of bombast that 'Rossini is the greatest and most complete musician of the nineteenth century,' and that 'Mendelssohn, of all men in the world, was influenced by the "formulas" invented by Rossini!' We might just as well say that Tom Moore was the greatest poet of the age, and that Robert Browning was never weary of imitating his poetic forms! After this we need not say that Wagner is patted on the back as a man of some talent, Meyerbeer and Weber just mentioned, and neither Schubert nor Spohr so much as alluded to. All this, of course, is sheer ignorance.

We next turn to his analysis of sound, which is hardly more satisfactory. If he had read Helmholtz's recent investigations into the nature of sound, we should have been spared these crude speculations.

Dr. Chomet's great discovery is, that sound is not merely caused by the vibration of solid bodies communicated to the ear, but is itself a fluid disengaged from solid bodies, called sonorous fluid. He might as well say that the apparent onward motion of a wave, which is caused merely by the vertical rise and fall of undulating water is a fluid disengaged from the substance of the wave and flooding the retina of the eye. The true account of sound is, that 'motion of a material medium constitutes the mechanical impulse which, falling on the ear, excites within it the sensation we call sound' (Sedley Taylor's *Sound and Music*). This motion must, indeed, be of a peculiar kind, and the medium *producing* it must be of a certain density, although, when once produced, it is capable of being propagated through mediums as rare as air, though not through vacuum. What mainly convinces Dr. Chomet that sound is a fluid disengaged from material bodies, and not merely constituted by the vibrations of material mediums, is the fact that vibrations set up in the air alone do not always produce sound, as when the hand is passed rapidly through the air. But the reason of this is obvious. Vibration of the right kind has not been set up in the hand first; therefore there are no sound-producing waves. Clap the hands, and then you get the *vibrations of a material medium* required. This is not the place to enter into the recent interesting experiments which have brought to light the conditions under which sound is propagated and travels; we merely record our opinion that Dr. Chomet's science is as faulty as his history; and when, in the last place, we come to his practical application of music to the treatment of disease, we find next to nothing at all about it. There is the effect of sound upon animals. We have all heard dogs howl at a band or organ; horses are cheered by the rhythmical jingle of bells; spiders are said to be musical. Then most of us have read about David and King Saul, and the charm of the harp that drove away the evil spirit. Pythagoras, Ulysses, Tyrtæus, also do duty; and the aid of military bands in battle is freely invoked. A number of instances more or less authentic are then cited of persons, especially women, who have derived benefit from music in disease, especially nervous diseases, and the whole dissertation is wound up by such incredibly commonplace rules as, 'Stir up the lymphatic constitution by strong and exciting music—calm nervous and excitable people by sweet and gentle airs. The

bilious person requires light songs, short, and full of pleasing gaiety.'

This kind of wordy rubbish is of no value at all, and we do not wonder that the Academy of Sciences paused before sitting down to listen to such a feeble exercise. And yet the subject itself is worthy of the most serious study. The power that music has of setting up peculiar and varied physical vibrations in the ear, and of so acting upon the whole nervous system as positively to change the nature and character of our emotions; this incessant diversion of nerve-currents—from grave to gay—making us sometimes insensible to pain itself, and at other times helping us to forget the present weight of annoyance or disappointment; the fact that music has the power of carrying us out of ourselves, should, in addition to its many other functions, commend it as a therapeutic agent of no mean efficacy. What is often wanted in the case of disease is to shake up the nervous centres. Change of air, change of scene, amusement, objects of hope—these are, as Dr. Chomet well knows, all-powerful in assisting nature to recover; and music has, to a great extent, this power over those who are sensitive to it. It shifts in a moment the emotional atmosphere of the mind; it snatches away the morbid current of thought, breaks up brooding, and actually gives rest to an overstrained set of nerves, by setting in vibration a different and unworked series, which it might have puzzled the physician to reach in any other way. These are the kind of facts which physicians would do well to ponder. We are sorry to say that, as far as Dr. Chomet is concerned, the ground is still almost entirely unoccupied. H. R.

Health in India for British Women; and on the Prevention of Disease in Tropical Climates. By EDWARD JOHN TILT, M.D. Fourth edition. London: J. & A. Churchill, New Burlington Street, W., 1875, 12mo, pp. 128.

A good deal of general information respecting tropical hygiene and cognate subjects has been thrown together in a somewhat sketchy and jaunty style in these pages. Their contents, however, scarcely correspond with the prominent feature of the title, 'Health in India for British Women.' Of what refers to women specially, there is really not very much more than what was to be found in a chapter of Dr. Tilt's work on 'Uterine Therapeutics.' The present work professes to be an amplification of that chapter, and a good deal of the additional matter has no very particular connection with the main subject of the work; not that it is not of considerable interest, and derived from a good many sources. If we mistake not, this book appears now for the first time. If this be so, is the author justified in styling it on the title-page a 'fourth edition,' because a portion of it has passed through some editions as a chapter of another work? It is difficult to ascertain for what class of readers the book is intended. In the preface the author seems to mean it for 'medical men,' and also for 'our countrywomen.' At p. 61 it is taken for granted that 'the medical reader is fairly grounded in uterine pathology.' In Chapter V. it is said that 'certain details are useless to a non-professional reader,' and immediately after this the author 'gives his first advice to a young lady,' whose attention we suppose he would direct to the details of pp. 35 and 55. At p. 84 directions are given apparently for the use of women, at least plain enough for them to follow. In short we think that the author should have more clearly indicated for what class of readers he has been writing.

It is unnecessary to examine in detail a popular work like this, but we shall point out some passages which have caught our eye.

We are told that 'the plains of Bengal are becoming more and more unable to oxidise the human excreta of which they have been the secular depositories.' The use of the word 'secular' here is as new, as the fact, which we suppose is meant to be indicated, is uncertain. At p. 41 an unusual cause is assigned for the recent prevalence of typhoid in Bengal 'in the increasing unhealthiness of its alluvial plains,' but perhaps Dr. Tilt is thinking of the vast dunghill he has described, and wishes to give a new development to the fæcal theory of disease. Then again our author is quite orthodox about malaria as being the cause of fevers, but at p. 64 he would seem to contradict himself by saying, that 'all authors are agreed that in tropical countries diseases, *i.e.*, fever, cholera, and dysentery, are principally caused by the action of cold on the frame debilitated by heat.' This is the view taken up by those who deny the existence of malaria, and whose opinions Dr. Tilt has repudiated at p. 41.

Our author is unfortunate in some of the statistics which he offers us in the early part of his work. The following mortality per cent. is assigned to the soldiers of the different presidencies: Madras 4·0, Bombay 5·0, Bengal 7·5. The great unhealthiness of Bengal is attributed to the vast accumulation of alluvial soil and of stagnant water in the plains, as if such were the usual characteristics of the whole of Bengal. Granting that such a state of things may exist in some districts, yet how few of our English regiments are quartered in them?—for many years the mortality in Fort William in Calcutta, in the heart of the alluvial plains, has been exceedingly low, only ·93 per cent. in the year 1873. But Dr. Tilt has, in a table at p. 115, presented a corrective to his own statements, which shows that they cannot have referred to recent years; and we can add to those of his table the still more recent facts, that the ratio per cent. of deaths in India among English soldiers has been: in 1871, 1·753; in 1872, 2·421; in 1873, 1·530; the rates for the year 1873 having been: Bombay, 1·172; Bengal, 1·540; Madras, 1·829—rates very different from those which he has assigned.

In the special portion of the work, we find that Dr. Tilt believes that malaria may cause uterine congestion. In ladies who have returned to Europe he has observed two chief forms of congestion; one, the less common, in which the neck of the uterus is especially implicated, and the more frequent one in which the uterus itself is enlarged. He laments that ladies from India show an unwillingness to subject themselves to local treatment, and are satisfied to trust to constitutional treatment alone; for ourselves we have not usually observed such backwardness.

We are told that the characteristic sign of uterine disease in India is dysentery. This is new to us. Every one knows that chronic diarrhœa, and still more acute dysentery, are alarming complications of pregnancy, and that in cases of dysentery life has often been saved by natural or by induced abortion. Dr. Tilt seems to believe that dysentery is frequently brought on by pregnancy, and he follows the late Dr. D. Stewart in thinking that it is often induced by inflammation and ulceration of the uterus. He seems also to believe that dysentery often follows parturition, which is contrary to our experience. Dysentery is a very common affection in India. Pregnancy is an occasional and very disagreeable complication of it, as it may be of various uterine affections, but it does not follow that it is its cause.

Our author does not appear to us to be very happy in all his remarks on dietetics. He would close regimental messes during the whole year, except the cold season, seeing in this the only remedy against excessive indulgence in the pleasures of the table. The wife of a Punjab officer appears to have given him an exaggerated account of the amount of stimulants usually taken by ladies in India. No doubt instances of excess are to be found among ladies in India as in Europe. Dr. Tilt hints at immoralities on the part of husbands in India, because they are removed from

the wholesome effects of public opinion. This scarcely applies to India, where it is impossible to conceal your most private actions, and where public opinion is pretty much the same on such matters as in Europe. Though Dr. Tilt does not always carry us with him, we agree with him on many points; for instance, in his commendation of the old voyage round the Cape. But no circumstances seem likely ever to make that voyage for the future a very convenient one, notwithstanding its hygienic value.

On the whole, this book certainly gives in a readable shape a good many useful hints about tropical hygiene.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

BUTLER, James, M.R.C.S. England, L.S.A. London, has been appointed Medical Officer of Health for the Long Eaton Urban Sanitary District; 25*l.* per annum; acreage 2,000; population, 5,000.

EATON, John, M.D., University Glasgow, has been appointed Medical Officer of Health for the Cleator Moor Urban Sanitary District; 30*l.* per annum; acreage, 992; population, 8,000.

GANDER, Mr. C., has been re-appointed Inspector of Nuisances for the Alcester Rural Sanitary District and his salary increased from 80*l.* to 120*l.* per annum.

HAYMAN, Henry, F.R.C.S. England, L.S.A. London, has been re-appointed a Medical Officer of Health for the Wycombe Rural Sanitary District.

THOMAS, Mr. J. E., has been appointed Surveyor and Inspector of Nuisances for the Cardiff Urban Sanitary District.

WARREN, Thomas, M.R.C.S. England, L.S.A. London, has been re-appointed a Medical Officer of Health for the Wycombe Rural Sanitary District.

VACANCIES.

BLACKBURN URBAN SANITARY AUTHORITY. Clerk to, and Town Clerk. Surveyor.

CARDIFF RURAL SANITARY DISTRICT. Inspector of Nuisances (one of two).

PRESTON RURAL SANITARY DISTRICT. Inspector of Nuisances.

RUGELEY. Certifying Factory Surgeon.

UPPINGHAM RURAL SANITARY DISTRICT. Inspector of Nuisances; 120*l.* per annum. Application, 13th instant to W. H. Brown, Clerk to the Authority.

WORCESTER RURAL SANITARY DISTRICT. Inspector of Nuisances. Application, 14th inst, to A. W. Knott, Clerk to the Authority.

SANITARY PATENTS.

1505. Improvements in the method of and apparatus for purifying carburetted hydrogen gas. Harry Whiteside Cook, Thurloe Square, London.

2083. Improvements in apparatus for heating air and ventilating buildings, parts of which are applicable to other purposes. Edward Thomas Hughes, Chancery Lane, London.—A communication from Sidney Smith and George Anson Bates, Worcester, Massachusetts, U.S.

2087. Improvements in the means and apparatus for the purification of gas manufactured from coal, cannel, shale, and like materials. William Cleland, Linacre, Lancashire.

2109. Improvements in the treatment of the gases developed by the decomposition of chlorides for the production of chlorine. Robert Hasenclever, Stolberg, Prussia.

2139. An improved mode of and apparatus for the preservation during transport of fruits, fresh vegetables, and other substances. William Lloyd Wise, Chandos Chambers, Adelphi, London.—A communication from Mdme. Dary, Paris.

2061. Distillation of pure water from salt water, etc. Luke Thomas, Leadenhall Street, London.

649. Water-closets. Samuel Hunt Rowley, Swadlincote.

1440. Water meters. William Edward Newton, Chancery Lane, London.—A communication from Phineas Ball and Benaiah Fitts.

1994. Conducting and controlling the flow or passage of water, etc. William Brooks, Chancery Lane, London.—A communication from Louis Alexandre Farjon.

ABSTRACTS OF SPECIFATIONS.

4256. Warming and ventilating. G. Eyre, Codnor.

This invention mainly consists of a fire-box of any suitable material, such box being connected by suitable tube to a series of chambers which constitute the flue. The series of chambers are constructed preferably of a U-shape, and they are divided by partitions. On the outside surface of these chambers it is preferred to cast or secure ribs or projections, so as to give greater heating surface. The series of chambers are encased by another chamber which is to effect the heating of the air before entering the room or apartment.

4262. Filters. E. Perret, Abingdon Street, Westminster.

The inventor takes a cylinder or circular basket of wire or perforated metal work, similar to that used in ordinary centrifugal machines for curing sugar, and places within it or against the inside the suitable filtering material, which material is returned upwards from the bottom to a ring capable of sliding upwards on a central spindle, thus forming a sort of annular bag between the disc and case of the cylinder.

4270. Ventilators. J. Hill and J. Hey, Halifax.

This invention relates more particularly to that class of ventilator known as 'Watson's Syphon Ventilator,' in which a diaphragm or diaphragms are employed for separating the 'shaft' and conical or other top part or hood into two parts, one for the egress of foul air, and the other for admitting a supply of fresh pure air; but it is also applicable to single-tube ventilators. The object of the inventor's improvements is to so construct the 'cowl' or head of the ventilator that down draft resulting from the force of wind acting on the ventilator may be avoided or reduced to a minimum, and fresh air regularly introduced, without reducing the ventilating capacity of the shaft of the ventilator, and dispensing with the use of a shield or deflecting plate suspended under the mouth of the ventilator below the ceiling, which, besides interfering with the efficacy of the ventilator, is unsightly in appearance.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer—not necessarily for publication.

REPAIRING PIPES.

A PUTTY of starch and chloride of zinc hardens quickly, and lasts, as a stopper of holes in metals, for mouths.

TENDERS FOR THE HASELEY WATERWORKS.

The tenders for construction of adits, reservoir, filter, beds, and other works in connection with the construction of the Haseley Waterworks, were submitted to the town council at their meeting on Tuesday, June 22, and were as follows: Anwell, Liverpool, 9,418*l.* 4*s.* 11*d.*; Lucas, Rugby, 6,672*l.* 0*s.* 9*d.*; Clarke, Warwick, 3,946*l.* 2*s.* 9*d.*; Hart, Leamington, 3,484*l.* 16*s.* 1*d.*; Smith (accepted), Milverton, 3,070*l.* 11*s.* 5*d.*; the engineer's estimate, 3,339*l.* 11*s.* The estimates were based upon a schedule of prices given by each contractor, and as there is a probability of water being found in sufficient quantities in the adits, a portion of the works, as specified, may not be required to be executed. Mr. E. Pritchard is engineer to the borough.

Communications have been received from—

Mr. G. W. Wigner, London; Mr. J. C. Melliss, C.E., Coventry; Dr. Milner Fothergill, London; Dr. F. S. B. F. De Chaumont, Woolston; Dr. Alfred Carpenter, Croydon; Dr. John Macpherson, London; Dr. J. W. Taylor, Scarborough; Dr. P. Hincks Bird, Lytham; Mr. Edward Jeffery, Lowestoft; Dr. R. P. B. Taaffe, Brighton; Dr. Edwin Slade, Ilfracombe; Messrs. Potts & Co., Birmingham; Mr. G. F. Chambers, Eastbourne; Mr. W. H. Hoffmeister, Cowes; Dr. John Taylerson, Whitby; The Medical Officer of Health for Teignmouth; Dr. John Griffith Lock, Tenby; Dr. James William Barry, Ramsgate; Dr. John W. Tripe, Hackney; Dr. Thomas E. Mason, Deal; Dr. R. Domenichetti, Louth; Dr. James Neal, Sandown; Mr. W. H. Bailey, Manchester; Messrs. Gardner & Co., London; Dr. Grimshaw, Dublin; Dr. John Pearson, Huyton; Dr. T. Orme Dudfield, Kensington; Dr. John Bateley, Yarmouth; the Medical Officer of Health, Dartmouth; the Medical Officer of Health, Dawlish; Dr. Henry T. Hartnol, Exmouth; Dr. Edwyn J. Slade-King, Ilfracombe.

A DELICIOUS effervescing beverage, extremely cooling and refreshing, may be obtained by the addition of a wineglassful of Rose's Lime Juice Cordial in Soda, Potash, Seltzer, and other Aerated Waters. Messrs. Rose and Co., of Leonard Square, Finsbury, recommend their Lime Juice Cordial also as a flavouring, much superior to the use of the Lemon, especially in hot drinks, with Whisky, Gin, Brandy, etc., being always fresh, and imparting a clearness and purity to the beverage not otherwise obtainable. Their Lime Juice Cordial may be obtained everywhere in town and country. Purchasers are respectfully requested to order ROSE'S LIME JUICE CORDIAL, the original manufacturers and patentees, all others being imitations. —[*Advt.*]

NOTICE.

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Original Papers.

PETTENKOFER ON CHOLERA.*

BY A. RABAGLIATI, M.D.

AFTER stating that he thinks Dr. Frank's suggestions worthy of examination, chiefly because they were published with the sanction of the Bavarian Government, and because many persons considered them as a kind of cholera *vade mecum*, Pettenkofer proceeds to say that, according to Dr. Frank, the means of prophylaxis necessary are divisible mainly into two :

I. Those for the individual.

II. Those for the community.

I. Resolves itself into wearing of flannel round the abdomen, proper diet, and the leaving of places infected by cholera. Pettenkofer does not enter upon these points ; but passes on to II., taking its paragraphs one by one.

1. The duty of medical men and heads of families to inform the authorities of the existence of cholera.

2. The necessity for having a certain number of medical visiting stations, and for having at hand a sufficient number of attendants.

With these two Pettenkofer agrees.

3. The necessity for special cholera hospitals.

Pettenkofer does not at all agree with this, and says that, even if he had not been originally of the opposite opinion, the facts adduced by Dr. Frank himself would have convinced him of its error. The hospitals whose experiences come under consideration are the great general hospital on the left of the Isar, the hospital on the right of the Isar in Haidhausen, the children's hospital, and the military hospital in Oberwiesenfeld. The experiences of these hospitals, so far as regards cholera, were exactly the same as those of the districts in which they were situated—the number of cholera cases in the hospitals increasing and diminishing in the same proportion as they increased and diminished in the corresponding districts. Thus the military hospital remained free from cholera just as did the neighbouring tavern 'Maximilian II.' But had the hospital been in the neighbourhood of the Turk's tavern, where there were both a winter and a summer epidemic, no doubt it also would have had the same experiences. So the hospital on the right of the Isar had a severe epidemic from November to February, and only one case in summer, in direct correspondence with the neighbouring inner and outer Wiener streets, which had fifty cases in winter, and only six in summer. Further, in summer, the cases appeared in the female wing of the hospital, where no patients suffering from cholera were admitted ; while the male ward, in which one cholera patient was admitted, escaped. And similarly with the children's hospital. Pettenkofer thinks little of the value of special cholera hospitals, because the attendants on cholera patients have never been more subject to cholera than attendants on other patients, and this has been the experience everywhere. In India soldiers, on the appearance of cholera, have to leave the place and take their sick with them. This, which is called by the English 'movement,' is now considered one of the most valuable precautions against cholera, being very successful among soldiers and prisoners.

In the general hospital in Calcutta, although for many years it has now been the custom to admit cholera patients among the others, yet for twenty years there has been no house-epidemic. Both Dr. Bryden in his work on 'Epidemic Cholera,' and the latest official sanitary report, agree that cholera is not communicated to the healthy by the proximity of cholera patients. And the same experiences have been felt in Europe. In the prison establishment at Laufen, for instance, there were, of 522 prisoners, 128 attacked by cholera, 43 by cholerine, and 125 by choleraic diarrhœa ; and there were 83 deaths. The attendants on this immense number of sick were the following : Dr. Berr, who (after he fell ill, though not of cholera, but of exhaustion and overwork, which brought on congestion of the brain) was succeeded by Dr. Loder ; two medical undergraduates, the chaplain, two attendants, and the overseer ; in addition, six attendants chosen from among the Moravian missionaries, and six overseers ; with twenty-four overseers, and twenty volunteers from among the prisoners. Of these sixty-three attendants, some of whom were among the sick day and night, only one died, a saddler, aged forty, less of the cholerine by which he was attacked than, in the opinion of Dr. Berr, from exhaustion. Of the volunteer attendants, only two others fell ill. On comparing these numbers with those of others who, though in the same building, had nothing whatever to do with the sick, we find that, of twenty smiths, ten were attacked and two died ; of twelve brushmakers, ten were attacked and four died ; and of twenty-one cabinet-makers, fourteen were attacked and eleven died.

Pettenkofer would however have special wards in general hospitals for cholera patients, and this he recommends, not as a concession to prejudice, but as a humane precaution in favour of the other patients, to whom the sight of others dying of cholera must be frightful and depressing.

Further, he thinks more advantage would be gained by the disinfection of all approaches to the hospital, and by that of patients who, though not suffering from cholera, yet may come from infected places, than by the erection of special cholera hospitals.

4. The closing and emptying of houses in which cholera has appeared.

He thinks that emptying of houses has been little studied, and that it would present great practical difficulties. He cannot admit, either, that the emptying of houses is one of the rules which commends itself for the future, or that even in those cases in which it is practicable it ought to be undertaken. If it is undertaken it is necessary to have a place to which the materials can be removed, and this place ought to be insusceptible to infection. But Dr. Frank could not allow that such a place could exist, since he had already committed himself to the contrary opinion in the case of the tilery on the Kirchstein. In reference to the fact that the whole district from Ramersdorf to Ismaning, although lying on clay and gravel, remained free from cholera during the last epidemic, Dr. Frank says, 'The teaching of the immunity of whole districts and of special places rests on a very unstable foundation, and the more so that it can be shown untrustworthy in reference to the ground-water theory of cholera,' and he adduces

* 'A Criticism by Max von Pettenkofer of the Suggestions for Prophylaxis against Cholera in the Future, offered by Dr. Frank, Physician to the Royal Bavarian Consistory Court.'

the fact that at a house in Ramersdorf, which does not belong to this district, three cases of cholera occurred, while in Kirchstein itself one occurred. But the house where the three cases occurred is a public-house, where there was much traffic, while the person who showed the single case of cholera in Kirchstein was a carrier who was travelling several times daily to infected places, so that these two sets of cases seem accounted for.

5. Separation of the sick from the healthy. Taking Dr. Frank's own figures, he shows this measure to have been a perfectly fruitless one. Thus, Frank says that in Munich there were 6,925 houses, of which 2,070 were attacked by cholera. These 2,070 houses showed a gross number of 3,040 cases of cholera. Frank has carefully inquired into the history of the epidemic in 392 of these houses, and he says in only 119 of them did a second case of cholera appear after the removal of the first appearing case to the hospital, while in each of the remaining 273 only one case appeared.

That is, we have

	Cases.
273 houses, with one case each . .	273
119 ,, ,, two cases at least each .	238

and in addition, Frank says

	Cases.
224 houses had epidemics, and supplied .	1,108
Therefore 616 houses supplied . .	1,619

Deducting these numbers from the whole number of houses infected and cases respectively, we have 1,454 houses supplying 1,421 cases, or less than a case per house. These figures contradict themselves therefore in two ways, first, because there is a balance of thirty-three houses in which no case of cholera could have occurred, though they are returned as infected houses, and second, because even if they are correct they show that of 392 houses, from which the first case of cholera was removed, 119 supplied more than one case, while in the 1,454 houses in which the rest of the sick were, and from which we are not told that the sick were removed, only 1,421 cases occurred. Otherwise, we may say, according to Frank, that 2,070 houses furnished 3,040 cases, and that 224 of these houses furnished 1,108 cases, therefore the remaining 1,846 houses furnished 1,932 cases. The overplus of cases being eighty-six, at least 1,760 houses must have had only one case. Of these, Frank says that 273 showed no second case after the removal of the first. In 1,487 houses about which there is no information as to removal no second case occurred.

6. The necessity for proper and sufficient ventilation in public-houses and inns.

7. Official examination of food. With these Pettenkofer agrees.

8. Drinking-water. Pettenkofer's criticisms under this head are quite personal to Frank.

9. Destruction of all wearing apparel.

10. Disinfection will be considered further on.

Pettenkofer says it is not at all confirmed by experience that the destruction of wearing apparel is a beneficial measure. It is not known by what means cholera spreads, although it is almost certain that human intercourse and not the air is the medium; but we can draw no conclusions from single cases. At the Sanitary Conference at Vienna Pettenkofer made some suggestions for discovering the causes of the propagation, which were unanimously accepted. One question arises at the outset, whether we ought to choose as the starting-point of our inquiries the 'cholera place' or the 'cholera patient.' In India it has always been thought that epidemics originate from certain districts and not from certain races. Therefore two schools may be formed, Contagionists and Localists. Pettenkofer recognised the important position of both and made a compromise in his own mind, but knowing that no good could come out of that compromise, he used his time in studying the propagation of cholera, and entered into a study of the epidemic of 1865 in Altenburg. But cholera was not very prevalent till the following year. The epidemic of 1866 is usually connected with the German war. This, however, is an error, as cholera was very prevalent in Holland and Belgium, which were in the profoundest peace. In Stettin it appeared before the war, and in Munich not at all, although that town was continually in connection with the seat of war. So earnestly did Pettenkofer feel on the question of the mode of propagation of cholera, that he determined to visit Lyons and Malta and Gibraltar. The first, because he wished to examine for himself a large district which remained free from cholera; the two last, because they are constantly quoted as bearing on the importance of condition of soil, etc., in reference to the spread of cholera. The results of his inquiries are published in vols. iv. and vi. of the *Zeitschrift für Biologie*. Though Pettenkofer owns he has not settled the question in the sense of the localists, he finds that some places do resist the infection of cholera in the most remarkable manner; and he thinks that the causes of this immunity are mainly two. (1) Fixed conditions, as of soil; and (2) changing conditions, as of rain and ground-water. Thus, though Lyons is the second town in France, a seat of manufactures and a point of convergence for traffic between the two infected towns of Paris and Marseilles, besides being the place to which many of the inhabitants of these places fled to escape the cholera, it has had, since 1832, only 800 cases of cholera. Now the parts of the town which have had no cholera at all are those which stand high on granite (Croixrousse, etc.). On the other hand, the part lying on alluvial soil (Brotteaux, etc.) might have been predicted to be susceptible to cholera, as, indeed, a study of the facts shows. Thus, in 1854, an exceedingly dry year, the alluvial portions were unquestionably affected, while the granite portions remained free even in 1854, as well as when the epidemic was raging in other years both in Paris and Marseilles. During the Revolution of 1849, Lyons was besieged by French troops, and was afterwards taken and occupied by them. Though cholera was among the soldiers it was not imported into the town, and only appeared in two hospitals, both of which were situated on the alluvial soil. Nor is the immunity of Croixrousse due to better hygienic conditions, since it is a dirty quarter occupied by labourers, and into which cholera has often been imported from Paris and Marseilles.

As to Gibraltar, the town is not on a rock impervious to water as is commonly supposed, but on a slope of red earth, which, in the words of Sutherland, was a constant spring of water for the population. Even in the driest season, a cut into it in the open street becomes filled with water.

Similarly as to Malta, Pettenkofer was informed by Mr. Inglett, who gave him every assistance in the prosecution of his inquiries, that 'Our rock is not a rock in your sense; it is a sponge impregnated and soaked with every kind of sewage.'

In Munich Pettenkofer met Dr. Douglas Cunningham and Mr. Timothy Lewis, two young medical

men who had been placed at the disposal of Dr. James Cunningham, the Sanitary Commissioner with the Government of India, for the purpose of investigating the progress of cholera. After receipt of the results of their investigations, Dr. James Cunningham published them in the form of nine conclusions.

These conclusions, Pettenkofer says, are in fullest agreement with his own views, but in contradiction with what has been done in Munich in past times against the epidemic, and will probably be done again when the opportunity arises.

The first twelve cases of cholera in the last epidemic in Munich were very carefully inquired into, without the discovery of anything to justify the supposition that the cases were communicated by one another. In Case 9, there was a suspicion that the disease was communicated by the washing of clothes; but Pettenkofer, after careful inquiry, comes to the conclusion that another explanation is the correct one, and that no data are furnished by this case for the opinion that the disease is communicable in such a manner.

As to destroying the wearing apparel, Pettenkofer says it is impracticable, as, taking each case at 100*l.*, the 3000 cases which occurred in Munich might have cost the town 300,000*l.*, if the damages which had to be paid in one case, in which the authorities ordered the clothes to be destroyed, may be taken as an indication for the rest.

Assuming now that the street-statistics as regards cholera, published by Dr. Frank, are correct, Pettenkofer finds that the first case of cholera showed itself in Munich on June 24, in the person of an American clergyman, who came, when yet ill, from Vienna. He was removed from the hotel to a neighbouring inn, and thence to the general hospital, where he died. The second case occurred on July 16, in the person of a merchant from Darmstadt, who also came from Vienna. He was removed from his hotel to a neighbouring inn, and thence to the general hospital, where he recovered. The next five cases occurred in persons who had never left Munich; but it is scarcely possible that these cases were caused by the previous two, because all the persons who were in relation with these two, at the hotels, at the two inns, and at the general hospital, remained well, and for a whole week none of the persons about these places suffered from the cholera and diarrhœa which manifested themselves in other parts of Munich. Besides, these five cases came from quite opposite parts of the town to those occupied by the first two. The only sort of roundabout intercourse between the cases was the fact that the doctor who attended the American clergyman was also the medical attendant of one of the next five cases: and further, in the house of the latter a visitor who seemed quite well came from Vienna and remained two hours, not using the water-closet. But the doctor cannot have conveyed the infection, since no others of his patients took the disorder. The facts therefore seem to exclude the possibility of infection by the two first cases.

The further spread of the epidemic emphatically contradicts the infection theory. By the end of July the disease was rapidly increasing. On August 11 and 12, thirty-nine and thirty-eight cases were announced. But then occurred a sudden check, so marked that on the last of September and on the two first days of October there was not a single case. Through the whole of October only isolated cases occurred, and in the first fourteen days of November only two isolated cases occurred, so that the epidemic might be said to be at an end. But, though the epidemic in single cases seems to be so capricious, facts collected from observations over the whole show that it is greatly dependent on season. Thus from 1848 to 1860 observations over the whole Prussian monarchy show that the epidemic is, as a rule, at its minimum in March and April, that it receives a considerable accession to its virulence in May and June, that it rises through July and August to its maximum in September, and gradually decreases to the minimum again in March and April. The question then arises, what is the determining factor in this rise and fall? Is it temperature, direction of wind, barometric pressure, rainfall or evaporation? Up to the present the temperature has been considered the determining factor, though it must be admitted, without sufficient reason. To show at least how little, intercourse between the sick and healthy had to do with the propagation of the disease, Pettenkofer mentions that the two 'terms' when houses are changed in Munich (when at least 15,000 people change their residences) fall, the one in April and the other in October. Now, although there must have been very many of these persons who went from infected places to uninfected, and though many uninfected persons must have gone to infected places, there was no increase of the epidemic at these times; while there was actually a progressive diminution in October. A more careful examination of the Munich winter epidemic shows that the cases divide themselves into two groups; the first reaching its height in December, and affecting chiefly the low-lying parts of the town. The second group consists of some cases in the same quarters, of cases from other quarters which took no active part in the summer-epidemic, and lastly of some cases which appeared in quarters where the summer-epidemic had raged. The houses which had been the chief seat of the summer-epidemic, however, showed no cases in winter, although meanwhile there had been great changes in the occupants. Now, this succession of two well-marked epidemics in one year is a unique fact scarcely ever seen before in these latitudes, and is so striking as to have been termed a 'freak' of the cholera. But, says Pettenkofer, cholera plays no pranks, but follows laws slavishly, and the question is how to account for the phenomena. Dr. Frank's explanation is on the theory of contagion; he says (1) that the population was infected through and through (had ceased to be susceptible); and (2) that disinfection had been of use. But it is evident that these explanations are not sufficient, since, had (1) been true, no winter epidemic could have come. As to disinfection, the case is quite as feeble; for though disinfection was only optional in summer and compulsory in winter, the epidemic in the latter was much longer and more severe than in the summer. Besides, owing to the temperature, disinfection is more likely to be successful in winter than in summer. When it is urged that, had there been no disinfection in winter, the epidemic would have been much more severe, the same cry has been heard before, and specially on one occasion, when, in fourteen days, more men died of cholera in a prison in Laufen than were ever known to do so even in India in the same time.

From my 'localist' standpoint, says Pettenkofer, I can explain the remarkable and abnormal behaviour of the cholera in Munich in the last epidemic, if not

in all its particulars, yet sufficiently in the main. That explanation depends on the ground-water. This explanation, though often suggested before and as often rejected, yet survives. Thus it was suggested, after its birth in 1856, as the explanation given by Buhl and Seidel of the spread of typhus in 1865 and 1866. It was supposed dead in 1867, a year free from typhus; but again revived in 1872; and finally revived by Dr. Port in the last cholera epidemic. Even in 1855 Pettenkofer held the opinion that there was a connection between ground-water and the spread of cholera, when he began to study the lines along which the cholera spread. The epidemic spread not along the railways and roads, but along rivers and brooks; and yet not along rivers which were the channels of traffic. The valley of the little Paar, for example, was free from cholera in its upper part, notwithstanding that it was crossed by the railway; while in the lower part there were numerous infected places. So with the Danube, the places in its course where the traffic was thickest remaining free, while the epidemic was worst where the traffic was least. Hence it was evident that rivers conveyed the disease more because they were the channels of drainage than the channels of traffic.

India, the home of cholera, shows this remarkably. During twenty-six years, for instance, in Calcutta, the rainfall in July and August averaged 343 and 365 millimètres respectively, and the cholera cases 3,900 and 3,400; while in March and April, during the same period, 14,000 and 19,000 were respectively registered, with a rainfall of twenty-eight and sixty millimètres. The temperature cannot be the cause of this difference, since the temperature of April and August is much about the same. And another reason for excluding the influence of temperature, is the fact that from Bengal to Archangel the cholera is found, both in winter and summer. Pettenkofer further thinks that much importance must be attached not only to dryness and wetness of the soil, but also to the fluctuations of the same; a change from dry to wet, or from wet to dry, being of great consequence. In Bengal there is not so much changeableness of rainfall throughout the year as in Munich. The Indian rainy season is a well defined one, lasting from May to October, and reaching its maximum in July and August. With its commencement (there is a rainfall of 1,400 millimètres in Calcutta in the rainy season; while in Munich there is only 800 millimètres in the whole year) the cholera begins to subside, and increases with the cessation of the rain till it reaches its maximum in April.

Cholera poison introduced may lie dormant for a long time without producing any effect, and may act when the conditions of the soil as to dryness or moisture favour it. So that it is altogether an assumption made by the contagionists to suppose, when cholera appears in any given place, that it was caused by previously existing cases elsewhere. The cholera, for example, which showed itself in Munich in August might have been introduced from Vienna in May, three months before, and the poison have lain dormant all the time. It was developed in May and June in Munich, which months were followed by a very dry July; and the epidemic was at its height in August. Such a condition of things favours the spread of cholera in lower Bengal, its home. Now, the reason of the sudden check to the epidemic in August is the fact that that month was, contrary to the rule in Munich, a very wet one, so that the ground-water rose. After that, it gradually fell to April of the following year; the epidemic, on the other hand, increasing till the rise of the ground-water, again in that month, put a stop to the disease.

Still this condition is not the only one which determines the rise and fall of cholera. What the other conditions are it may be difficult to say, but they are all necessary. Two of them probably are traffic and the condition of the soil; and though it may not be necessary that the x of the traffic and the y of the soil should come together in the soil, yet it seems probable that both must deliver their products independently of one another into human habitations. Or the y of the soil may have been carried into a whole (German) house, but may not have remained there equally, being removed by cleanliness, etc., from some parts and not from others. Hence Pettenkofer can imagine an epidemic in a thickly inhabited six-storied house confining itself to a single dwelling or even to a single room, without feeling any necessity to suppose that the first case infected the rest.

A comparison is now made between the rainfalls of Munich and Salzburg, two places similarly situated as regards mountains. In 1873, Augsburg had 31 per cent. more rain than Munich, nearly one-third. In the month of November the cholera epidemic most fiercely revived in Munich, where only 32 millimètres of rain fell, while in Augsburg 100 fell. In 1854 there was a cholera epidemic in Augsburg much more severe than in Munich; and in the same year, to judge from observations made at Göggingen, half-an-hour's journey from Augsburg, the weather was much hotter and drier than at Munich.

10. Disinfection. After giving a definition of a disinfectant as 'everything that destroys the effects (*Stämme*) of cholera patients, particularly their stools and vomited matter, Pettenkofer proceeds to say that it has never been proved that the stools are the seat of infection. To show this he describes this fact. In 1865 the inmates of the hospital for old and invalid people in Altenburg had been removed into the upper stories, while the basement was used as a cholera hospital. Not a single case of cholera, or even choleraic diarrhœa occurred on the basement among the healthy. Now it cannot be assumed that there was a local insusceptibility to cholera among the inmates. Nor is the cause of immunity to be attributed to disinfection, though that was very carefully carried out, since disinfection has failed elsewhere; and besides, the district round the hospital which was not disinfected remained intact. John Simon, at the cholera conference at Vienna, in 1867, owned that he felt disappointed at the failure of disinfection, though he still recommended it.

The question 'Can an artificial immunity be produced,' has been answered, Simon thinks, in England, where cholera is not known, or only to a small extent, as an epidemic; and then only when two conditions are present—either the air is poisonous or the water is poisoned by excrements. The object in England is disinfection in the best sense, *i.e.* removal of that in which the cholera may settle in the soil. This agrees with the views of Pettenkofer, who wishes to cancel his former opinion that the source of infection is the excrements of cholera patients. Persons who perform *post mortem* examinations on the bodies of persons who have died of cholera, although they sometimes injure themselves, are no more subject to cholera than other people.

The following case bears out these views. A prisoner, when dismissed from Laufen jail, was suffering from diarrhœa, but pretended to be well. He travelled for three days, his diarrhœa and pain increasing. He used every closet on the way, in inns and other buildings. He travelled in a crowded coach, and in order to get relief from his pains, and warmth, he lay down in despair on a dung-heap, allowing his bowels to empty themselves. When arrived at Vilsbiburg, he repaired to the hospital very faint, remained three days unconscious, and suffering from 'cholera-typhoid,' and then recovered. According to the views of the contagionists, there should have been an epidemic along that man's road; but not one of the numerous places he passed had a single case of cholera, nor was one of the travellers by the coach attacked.

Pettenkofer next quotes authorities—and among the rest Dr. Douglas Cunningham and Timothy Lewis, who experimented on a large number of dogs by injecting excrementitious matter from sick and healthy persons into their blood, without ever being able to induce in the animals any disease by the unhealthy stools, which could not also be induced by the healthy—to prove that animals cannot be infected by cholera through the stools of cholera patients.

Further, the fact that at the prison of Laufen, where cholera was raging (Pettenkofer calls it an *explosion* of cholera), not one of the nineteen workmen who removed the cholera sewage suffered from the disease shows how little cholera is communicated in this way. This fact would also seem to render untenable the supposition that cholera spread in the prison by means of the closets.

Pettenkofer next goes into a number of facts and figures, which prove that Frank is wrong in attributing the gradual diminution of cholera cases in the house epidemics in the general hospital to the better disinfective measures adopted. One fact mentioned is, that in 1854 the town epidemic was as two and a half to one as compared with the town epidemic of 1836, although, both in the town and in the hospital, disinfective measures were much more largely adopted in the former than in the latter year.

All the facts, indeed, point to the conclusion that the situation of a locality, far more than the disinfective measures adopted, determined its liability to cholera. Thus, in the military barracks, great care was taken in the matter of disinfection, and yet the soldiers suffered, as appears from the statistics given, even more than the citizens, proportionally to their numbers; a fact which shows the fruitlessness of the disinfective measures adopted; and the same conclusion has just been proved true of hospitals. For all these reasons Pettenkofer does not believe in the efficacy of disinfective measures to house closets, and is further confirmed in this opinion by the fact proved by Dr. Erismann that disinfection at best only diminishes the gases in closets one half. Nor is this conclusion a wonderful one, since disinfection has proved quite unable to destroy the fatal 'Milzbrand' of cattle, and the 'Klauenseuche' of sheep; and it is therefore to be regarded as more probable than not that it will equally fail as regards cholera-typhus in man.

11. Prohibition of public dancing, large fêtes, meetings, etc.

The necessity for this restriction is quite disproved by the experiences of prisons, which, though none of those gatherings are allowed in them, suffer equally with the rest of the population from cholera.

12. Care in removing vagrants and beggars.

Pettenkofer thinks this hardly worth the trouble, as other strangers can go and come as they like; and if such measures are adopted at all they should apply as well to everyone leaving an infected place as to patients.

13. Control by the police over dead bodies.

Pettenkofer thinks there is no reason to suppose that corpses are more dangerous than living persons; on the contrary, as they can be treated in a far more summary manner than the latter, that they are less so. In case of the deceased person having been in an infected place it might be well before removal to cover the corpse with chloride of lime and put it in a metal coffin, which ought to be soldered.

General Conclusion.

So far back as 1865 Pettenkofer published the following opinions.

A cholera epidemic requires for its development,

1. A layer of inhabited soil which is pervious by air and water to a certain depth.

2. An alteration from time to time of considerable amount in the moisture of this layer, which is most easily seen in the changing condition of the groundwater of alluvial soils, the time of the settling down of which from an unusual height indicates the time of danger.

3. The presence of organic matter, particularly excrementitious matter, which has permeated the susceptible layer of soil.

4. The specific germ spread by human intercourse, the specific cause of cholera, chiefly conveyed by the intestinal discharge of patients suffering from choleraic diarrhœa, and which may even be conveyed by healthy persons coming from infected places.

5. A predisposition in the individual to suffer from cholera.

In the last ten years' study of cholera Pettenkofer has changed his mind only on the fourth head, as to thinking that the cholera germ is confined to the excrements of patients suffering from the disease. These five opinions were later reduced to three.

1. Influence of intercourse (cholera germ).

2. Predisposition in place and time (condition of soil and of groundwater).

3. Individual predisposition (condition of the body).

Activity should be directed to these three sources. But it is difficult to have any influence on intercourse (1) and almost as difficult to exert any on individual predisposition (3). No. 2 offers the best field for a systematic prophylaxis on the part of the state and of the commune, and the example and success of English towns prove this. Drainage and good water prevent the soil on which a town stands from being permeated by refuse, etc., and also prevent excessive fluctuations of its humidity. As to the recent great diminution in the number of cases in Munich, that depends mainly on improved sanitary conditions. Finally, Pettenkofer thinks intercourse may be looked upon as a slow match which carries the virus of the epidemic, and that the danger is proportioned to the amount of locally accumulated explosive material. Direct your attention to that material, and not to the impossible task of hunting after the sparks carried along by traffic.

EPPING FOREST FOR THE PEOPLE.

BY FRANCIS GEORGE HEATH.

What is to be done with Epping Forest? This is the question which remains to be answered now that the long-protracted contest for the maintenance of the commoners' rights in and over the fine old Essex woodland has been established by law. In my recently contributed paper on the Epping Forest question,* I remarked that I should discuss in a subsequent paper the statement made by the Epping Forest Commissioners towards the end of their report, that 'although the public had long wandered over the waste lands of Epping Forest without let or hindrance,' they could find no legal right to such user established in law, but that this 'user' would be a matter for consideration in the settlement of the scheme, *i. e.*, the scheme for the appropriation of the forest.

It will be remembered that the finding of the Epping Forest Commissioners was to all intents and purposes the same as the finding of the Court of Chancery in the suit of the Corporation of London against those lords of manors and others who had illegally enclosed the forest lands. This finding was, 'that the owners and occupiers of land and tenements within the regard of the forest, not being waste of the forest or enclosures from waste, have a right of common of pasture for commonable cattle within the forest, namely, horses and neat beasts, *levant* and *couchant*, on their lands and tenements as aforesaid, as appurtenant thereto, on all the wastes of the forest, according to the assise and customs of the forest.' The finding was further to the following effect (I quote from the report of the commissioners), 'that the present waste of the forest within the regard thereof, as ascertained by us, is 6,021 acres, 0 roods, 28¼ poles. Of this quantity, 3,014 acres, 1 rood, 6¼ poles are open waste, and 3,006 acres, 3 roods, 21¼ poles are enclosed; that over 3,558 acres, 1 rood, 10¾ poles your Majesty's forestal rights have been conveyed or released, and over 2,462 acres, 3 roods, 17½ poles they still exist.'

The Commissioners having also decided—and on this point, too, substantially in accordance with the verdict of the Court of Chancery—that 'all enclosures, within the regard of the forest, made since August 21, 1851' (the date to which the inquiry of the Commissioners and its judgment thereupon were limited), 'where Her Majesty's forestal rights had not been conveyed or released were unlawful as against Her Majesty and the commoners, and that where Her Majesty's rights had been conveyed or released, enclosures within the regard of the forest made since August 21, 1851, were unlawful as against the commoners,' it is clear that the public have regained by the legal proceedings in the case of Epping Forest 3,006 acres, 3 roods, 21¼ poles, which had been surreptitiously or openly 'filched'—not to use a much stronger and more emphatic expression.

Illegal and obnoxious fences, therefore, enclosing the large area of over 3,000 acres of forest land in Epping and the adjoining parishes, will have to go down 'with a run,' the open area of the forest will be doubled, and the public will henceforth have six instead of three thousand acres of land for purposes of healthful recreation and enjoyment.

The road to this enjoyment is, however, apparently barred by the somewhat startling statement made by the Commissioners to the effect that the public, *i.e.*, the general public—those in fact who are other than 'the owners and occupiers of land and tenements within the regard of' Epping Forest—have no legal right to use or wander over the waste lands of the forest, although they have 'long wandered' over them, as a matter of fact. But the public need not be alarmed. The battle of this forest has not been fought only for the sake of the commoners of the forestal parishes. It has, indeed, been fought chiefly for the inhabitants of the metropolis and for the public at large. An immemorial custom has acquired the force of law. If no man can enclose this 'waste of the forest,' it is clear that no man possesses the individual right, nor does any body of men possess the right to bar ingress upon the lands.

Six thousand acres of Epping Forest being, therefore, open for purposes of public use and enjoyment, I come to the important point now to be considered, namely, how this land can best be used and enjoyed by the public? and it is this point that the Epping Forest Commissioners are empowered, by virtue of the Act of Parliament under which they were appointed, to decide.

Since the publication of my last paper on this subject the Commissioners have held a meeting, at which the chairman stated that the Commissioners would be glad to receive suggestions for a scheme for the preservation and management of the Forest. This proceeding on their part is certainly to be commended, and it is a recognition of the public interest in the Forest question. The 19th of the present month is the date fixed for the receipt by the Commissioners of the various schemes which may be presented by or on behalf of persons who have been interested in the Forest; and ten days will be given from the date referred to, in order that those who may wish to do so may offer suggestions on the schemes actually presented.

It is understood that schemes will be presented by the 'Forest Fund' Committee, by the Corporation of London, by the Metropolitan Board of Works, by or on behalf of the lords of manors in the Forest, and by some private individuals.

It would at this moment be premature to comment upon what these several schemes are likely to be. The plans will probably show considerable divergence; and I propose to take the opportunity of discussing them when they are published. The Commissioners may, of course, (1) select any one of the schemes presented to them, (2) reject the whole of them and frame an independent scheme of their own, or (3) frame a scheme which may avoid the defects and include the good points of the several suggestions which are made to them.

One thing, however, all parties must bear in mind, Epping Forest must be retained in its unity as a great waste of forest land. It must not be turned into a mere aggregation of parks; but it must remain as a wild woodland. The propounders of 'schemes' may be left to make suggestions on matters of detail, such as those relating to the management of the Forest; but public opinion will not tolerate any attempt to regard this fine area of 6,000 acres of open woodland as anything but a forest.

* See SANITARY RECORD of June 19.

THE Pollution of Rivers Bill was read a third time and passed on Monday, July 12.

THE
SANITARY RECORD.
SATURDAY, JULY 17, 1875.

TO SECRETARIES OF SANITARY ASSOCIATIONS AND KINDRED SOCIETIES.

The Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers read before the members of any sanitary or kindred association.

LONDON DRINKS.

WE have to call attention to the report on Wines, Beer, and Spirits, presented to the Hackney Board of Works by Dr. Tripe, the analyst for the district. This report differs from any other which we have met with, as it refers rather to the quality of the spirit mixed with wines abroad than to the presence or absence of the ethers and other constituents on which the bouquet and other characteristics of wine depend. This is a most important matter as regards health, as a very large number of persons are in the habit of drinking cheap wines, which, if the samples analysed by Dr. Tripe are to be taken as a fair specimen, must prove injurious to health. It was considered when the duty on wines ceased to be levied according to the various classes and qualities of wines, and differed only according to its alcoholic strength, that good, cheap, and wholesome wines of low alcoholic strength would be imported into this country, so as to take the place of the fiery ports and sherries, or of the strong beer so freely drunk. This change in the kind of wine drunk has extended chiefly to the champagnes, clarets, etc., which are drunk by the upper middle and wealthy classes, whilst the poorer classes, if they drink wine, still adhere to port and sherry. What cheap port and sherry contain, and their effects on health, may be judged of by the report, which states that most of the ports and sherries 'were highly fortified with a coarse spirit, and when distilled, afforded an offensive and fiery distillate with scarcely any vinous smell. One of the sherries was, if possible, worse than the ports, as I do not believe that it contained any wine at all, but was merely a mixture of coarse spirit, sugar, colouring, and flavouring matters, so as to imitate the wine.' One of the so-called ports is stated to have consisted chiefly of elder-berry juice mixed with coarse spirit, and the others of more or less 'Spanish red,' with similar spirit, and perhaps some Oporto wine.

Two of the brandies were purchased at 2*s.* 4*d.* per bottle and 'gave as a distillate a coarse, fiery, offensive spirit, without any brandy flavour whatever, as the whole of the flavouring matters were left in the retort.' The only virtue they possessed appear to have been their great extent of dilution, viz., to 40 per cent. under proof, which the fiery taste of the spirit allowed to be done without much chance of detection. The spirit distilled from the brandies and foreign wines is described as being potato or grain spirit contaminated with fusel oil, which contamination, we regret to read, is regarded by the analyst as an impurity rather than as an adulteration. Whether this be so or not, it certainly ought to be a statutable offence to mix spirit of this abominable kind with wines or brandies, or to sell them when so mixed. If persons drink Irish whisky, they know or ought to know that if the spirit has not been kept long enough for the fusel oil it always contains when freshly distilled to be converted into the flavouring matter so much appreciated by many, they risk having at least a headache in the morning, and probably a congested stomach. But it is not to be endured that German rye, or potato spirit containing this poisonous oil should be admixed with wines or brandies, and so disguised by the flavouring, that none but good judges or the analyst can detect its presence.

After reading the results of the analysis of cheap wines and brandies, it is somewhat refreshing to find that the much abused gin was found to be pure, sweet, and without any other admixture than sugar and water. The cheap gins were reduced with water according to the price charged, as that sold at 2*s.* per bottle was as much as 47 per cent. under proof. It certainly seems hard on the milkman to be summoned for putting 10 per cent. of water to his milk and selling it at 4*d.* per quart, whilst the publican can add with impunity 25 per cent. of water to reduce his gin from 2*s.* 6*d.* to 2*s.* per bottle, thus getting a good profit on the added water.

The samples of porter and ale appear to have been fairly good with two exceptions, in one of which water and salt were added to a rather large extent, and the other water only. We are not able to judge of the amount of dilution, as the quantity of spirit contained is not stated, but the specific gravity only is alluded to. It is, however, satisfactory to find that no cocculus indicus, tobacco, or strychnine was found. The addition of chirata is, however, specially mentioned, with the remark that 'I am not prepared to say that it is not as good a bitter as that of the hop.' This, however, seems to be scarcely the question, as we ought to have 'hop beer,' and not medicated beer, which we contend the addition of chirata makes it.

It seems to us that this report raises the whole question as to what is wine, brandy and beer? Is a compound rightly sold in England as wine when it contains no juice of the grape? is brandy to be vended here which is equally innocent of spirit from the same fruit, and may beer be legally sold which

does not contain any infusion of hops? It is to be hoped for the sake of the health of the community that these questions will be speedily settled, although a careful consideration of the clauses of the new Adulteration of Food, Drink, and Drugs Bill holds out but little promise of a solution of this most important matter.

There is another issue indirectly raised as to the wine we are entitled to have when we ask for port or sherry. Are we to be supplied under the former name with 'Spanish Red,' or as it is sometimes called 'Spanish Port,' instead of an Oporto wine; or under the latter with a Marsala or some similar wine instead of a Spanish wine? Old established usage is certainly in favour of the name of port being confined to the produce of Portugal, and of sherry to that of Spain, but modern custom appears to have extended these names to any wines or compounds which have the appearance, and to a certain extent, the flavour of these highly prized articles of drink.

There is still a serious aspect of the case, which requires much consideration amongst medical men. We allude to the use of cheap ports and sherries by the sick poor. When a person is suffering from a disease attended with debility, recovering from fever or other severe illness, it is customary to order a glass or two of port wine daily. If this be ordered for a poor person, or even one who is somewhat better off, a bottle of cheap port is obtained from the neighbouring grocers. The report shows what he is likely to get, and we leave our readers to judge of the effects of such abominable compounds as those described by the analyst. In our opinion, when stimulants are required it is safest to order Scotch whisky, which does not ordinarily contain fusel oil, rather than brandy or wine, which, unless high-priced, may be so highly charged with it as to endanger the recovery of the patient.

THE RIVERS' POLLUTION BILL.

WE resume this week our brief notes on this Bill, as accepted by the House of Lords, but having regard to the great and important interests affected, and the lateness of the session, we do not think it by any means certain that the bill will pass this year, much as we desire that it should do so.

It is the duty of every urban and rural authority to enforce the Rivers' Pollution Act in relation to any stream within or passing through or by any part of its district, whether the offence be committed within or without its own district. The expenses will be defrayed in the usual way.

Any person may take proceedings to enforce the Act, independent of the local authority, and on complaint that the Act is not adequately enforced, the Local Government Board, after inquiry, may enforce the Act by an appointee of its own.

The Local Government Board may by provisional order constitute conservancy authorities for the catchment areas of rivers, or for parts of such areas. The Act confers very extensive powers on the Local Government Board as to the constitution, election, and business arrangements of such authorities; and the Local Government Board may by order constitute any urban sanitary authority having jurisdiction within a catchment area the conservancy authority for the whole of such area; but this appointment can only be made with the consent of such urban authority.

Offences under the Act are to be dealt with by the county courts which have jurisdiction in the places where the offences are committed. A county court judge is empowered to issue summary orders somewhat analogous to injunctions in Chancery. Default in compliance with an order may involve a continuing penalty of 50*l.* per day or less, and the court may appoint persons to carry into effect its orders.

There may be an appeal from the decision of the county court to the High Court of Justice. The appeal is to be in the form of a special case. Some regulations and restrictions as to appeals are prescribed.

The section relating to penalties is rather elaborate in its terms. All penalties are to be paid into court. The court may award all or any part of the penalties to the plaintiff as compensation for the damage he may have sustained, and for his costs. The residue is to go to the Imperial exchequer. The court may remit a penalty within three months, and a payment of penalties is to be enforced in like manner as payment of any debt adjudged by the court to be due.

Provision is made as to the service of notices, and the Act is to be cumulative.

The interpretation clause contains very comprehensive definitions of 'stream' and 'convey.' 'Stream' is to mean any rivers, streams, canals, lakes, water-courses or portions of the same, and such tidal waters or portions of the sea as the Local Government Board shall, by order under seal advertised in the *London Gazette*, declare to be subject to the Act. To 'convey' matter into a stream is to signify 'to cast such matter, cause it to flow or fall, or so to dispose it that it does flow or fall, or is carried by flood or otherwise into such stream.'

Such is a succinct outline of what may be called a plain and straightforward, even if not very ambitious, measure. Unquestionably it does not go nearly far enough, but probably no more stringent bill would yet awhile have any chance of receiving the sanction of the legislature.

ADULTERATION OF BEER.

SIX publicans were summoned at Wednesbury recently, charged with adulterating beer with salt, to the extent of from 59 to 116 grains to the gallon. Fines from 10*l.* downwards were inflicted.

Notes of the Week.

THE SCARLATINA OUTBREAK AT A FASHIONABLE PARTY.

A SUGGESTION has been made that this outbreak may have been caused by table-linen having been returned from an infected laundry. We have been informed that all the linen had been stored in the wardrobe since last November, so that the outbreak could scarcely have been caused in that way. No new dresses had been worn by any member of the family, so that the dressmaker and the laundress each stand exonerated from being centres of infection in this case.

CHOLERA IN THE EAST.

THE last advices from Syria state that at Homa the malady appears to remain stationary, and that several cases are reported daily. Dr. Dillon, who was deputed to go to Homa by the Turkish Government, has fallen a victim, and has become another martyr to the medical profession. The epidemic is spreading, and the Government have issued instructions that all travellers entering Syrian cities must be fumigated, and all houses attacked be disinfected, and the sick isolated. At Syria and Trieste all vessels coming from Syrian ports are placed under a quarantine; and at the Turkish ports the vessels are placed under medical inspection. The central board of health in Constantinople are about to send out a medical commission, of which Dr. Milligan, jun., and Dr. Zitterer will be prominent members.

SALT IN BEER.

IN our present issue we give an account of several small brewers at Swansea who have been fined 5*l.* each and costs for selling beer which contained from 50 to 117 grains of common salt per gallon. In some of the cases the solicitor for the defence urged that the excise allowed fifty grains per gallon, and that the quantities found were very little in excess of that amount, but the magistrate refused to take cognisance of any such alleged permission, and stated that they must be guided by the Act of Parliament which distinctly prohibited the use of salt at all.

When the beer was examined by the Inland Revenue, under the Adulteration Clause of the Intoxicating Liquors Act, we believe the Home Secretary, on the representation of the Brewers' Association, directed that where the amount of salt did not exceed fifty grains per gallon, no inquiry was to be made whether it was naturally present or had been added. This decision was doubtless founded on the fact that genuine beers contain variable proportions of common salt derived partly from the malt and hops, and partly from the saline matter naturally present in all waters used for brewing purposes. In some instances, where there is a slight infiltration of sea-water, or where the water is imbued with rock-salt, the brewing water contains more than fifty grains of common salt to the gallon, and further, in all cases it is necessary to make an allowance for the concentration produced by the boiling to which the wort is subjected, and which necessarily increases the proportion of salt originally contained in a given measure of the brewing water.

There is no doubt whatever that salt has a preservative action on beer, and brewers becoming acquainted with this fact, have, with advantage, used small quantities of salt, especially during the summer season. The presence of salt in beer is not injurious to health, and we presume, under the forthcoming Adulteration Act, brewers will still be allowed to use salt in reasonable proportions, and before any prosecution is instituted inquiry will be made as to the origin of the beer, to ascertain the quantity of common salt naturally present in the brewing water, as has been the practice with the Inland Revenue.

HOSPITAL FOR INFECTIOUS DISEASES AT GOOLE.

THE recent severe epidemic of scarlet fever at Goole, and the means it afforded for directing the public attention to the unsatisfactory sanitary condition of that town, has resulted in the provision of hospital accommodation for infectious diseases. The Local Government Board have recently given their consent to the fever hospital at the rear of the workhouse being used as a non-pauper hospital for infectious diseases. It may be useful to note the three principal conditions which have been imposed by the Local Government Board in granting their consent to this arrangement. In the first place, the management of the hospital for infectious diseases is to be entirely independent of the workhouse establishment; secondly, the building is to be separated from the ground upon which the workhouse stands by a wall, and a separate entrance is to be provided; and thirdly, that at least 2,000 cubic feet of space is to be allowed for each bed, and that arrangements are to be provided for the simultaneous reception of fever and small-pox patients. As the management of the hospital will devolve upon the Goole local board, as the sanitary authority authority of the district, the Local Government Board suggested, moreover, that the guardians should reserve to themselves, and to the rural sanitary authority, the right to send pauper and rural in-patients to the hospital at a fixed rate of payment. At the meeting of the Goole guardians on the 2nd inst. arrangements were made for adopting all these suggestions, so that in future the Goole local board will be better able to successfully cope with epidemics of infectious disease than they were on the last occasion.

THE FORTHCOMING SANITARY EXHIBITION.

THE fourth exhibition of sanitary, educational, and domestic appliances in connection with the Congress to be held at Brighton, will take place from October 6 to the 16th, in the Corn Exchange, adjoining the Dome of the Pavilion. The object of the exhibition, as heretofore, is to bring under the notice of the public generally, and particularly those who are interested in social, sanitary, educational, and economical questions, the latest scientific appliances for improving the public health, promoting education, and advancing social economy. These will be classified under the following heads, viz.:

I.—Warming, Ventilation, and Lighting.
II.—Domestic Appliances and Economic Apparatus.
III.—Sanitary Architecture and Appliances.
IV.—Sanitary Engineering and Methods of Disinfecting.
V.—Food and Clothing.
VI.—School Furniture and Educational Apparatus.

These classes are intended to admit all sorts of utensils and appliances appertaining to the advancement of social science. The exhibition will be opened with an address, to be delivered in the dome, to which the public will be admitted free. Lectures on the various classes of exhibits will be given in the dome on different days. A small charge will be made for space and admission, to cover the cost of the necessary arrangements and defraying the working expenses. The following have consented to act on the committee of management: Lewis Angell, Esq., C.E., Sir J. Cordy Burrows, William Clode, Esq., H. W. Freeland, Esq., Captain Douglas Galton, C.B., F.R.S., George Godwin, Esq., F.R.S., Rowland Hamilton, Esq., William Hardwicke, Esq., M.D., James Heywood, Esq., F.R.S., Professor W. B. Hodgson, LL.D., William Hope, Esq., V.C., Baldwin Latham, Esq., C.E., W. B. Richardson, Esq., M.D., F.R.S., Thomas Sopwith, Esq., F.R.S., John Yeats, Esq., LL.D.

MAGISTERIAL DECISIONS AT GREENWICH.

IN our issue of the 3rd inst. we published, under the heading 'Magisterial Vagaries,' a letter from our corre-

spondent Mr. Scott, commenting somewhat severely on the course which one of the magistrates of the Greenwich Police Court has recently seen fit to pursue in the cases of milk adulteration which have been brought before him.

Without questioning the accuracy of our correspondent's statements, we might have felt some hesitancy in accepting them in their entirety, but that we find by a perusal of two of Mr. Wigner's recent reports that they are absolutely confirmed by that gentleman, as also by a report of some cases recently decided which we print in another column.

It therefore becomes our duty to call attention to the way in which the Adulteration Act is mal-administered in some metropolitan districts.

In the localities indicated by our correspondent it would appear, at first sight, as if every needful appliance for the due enforcement of the Act in question existed.

The district boards are anxious to do their duty, the inspectors are vigilant, and the analyst is industrious and capable, and yet the fact remains that the adulteration of milk is more commonly and extensively practised now than it was before the passing of the Adulteration Act.

The reason for this apparent anomaly is, unfortunately, not difficult to ascertain.

The magistrate who, by the grace of the Queen and for the profit of adulterating milk-dealers, fills the judicial chair at the Greenwich Police Court has taken it into his magisterial head, that because he does not understand milk analysis no one else can.

It is in vain to explain to him that the standard of 'milk' which the public analysts take, for the purpose of analysis, is that of the very poorest milk ever yielded by mortal cow, and that, therefore, it is morally impossible that a man can be prosecuted on an analyst's certificate unless his milk is beyond question adulterated. It is useless for the analyst to attend in person prepared to verify his results by figures and submit himself to cross-examination.

It is idle to suggest to the worthy stipendiary that if he chooses to doubt the accuracy of the analyst's certificate, it would be only fair, alike to the prosecution and the accused, to have a check-analysis made.

None of these things move him. Enveloped in an impenetrable cloak of blissful ignorance, alike of the subject on which he dogmatises, and of the injury which his mistaken mercy works, he endeavours to make things 'pleasant all round.'

He compliments the Boards on having only fulfilled their duty in prosecuting. He declines to examine the analyst, on the ground that he quite admits the correctness of his analyses. He is compelled, much against his better nature, to convict the interesting offender before him, but he fines him the very lowest sum he can, and finally assures him, magisterially, that he considers him an ornament to his profession and an honour to his sex.

On the first blush, the idiosyncrasy of the worthy magistrate is chiefly striking for the preponderance of the comic element; and truly, if it only concerned district boards, public analysts and dairymen of easy virtue, it might be merely a matter deserving banter, but unfortunately the subject has a serious side.

In our teeming population, with our artificial and high-pressure way of living, it is of the last importance that the food and drink of the very poor, meagre and scant enough in any case, should at any rate be supplied in a pure state; and while it is impossible to condemn too severely the scurvy knave who, for the purpose of increasing his gains will impoverish and debase the chief aliment of our little children, it becomes us to treat with hardly less reprobation the decisions of a magistrate who, instead of punishing, seems rather to palliate and encourage such offences.

Report.

SANITARY MATTERS IN DUBLIN.

WE would specially direct the attention of our readers to the following report of the proceedings of the Dublin Sanitary Association, which show that the sanitary defects which we pointed out as existing in Dublin in August, 1871 (see *British Medical Journal*, September 11, 1871), remain to a great extent unremedied. The large amount of evidence which has been accumulated by the labours of the Association and the statistics compiled by Dr. Burke, of the Irish Registrar-General's Office prove conclusively that a public inquiry is necessary in order to ascertain accurately the causes of the unhealthy state of the city. We believe these causes are not difficult to find. Our correspondent found no difficulty in finding them in 1871, and we scarcely think the ingenuity of the Dublin Corporation can hide them from the gaze of a Local Government Board Inspector. We congratulate the association on the course it has pursued in determining to call for a public inquiry. Such an inquiry must result in good not only to the citizens but to the local sanitary authorities.

The annual general meeting of the Dublin Sanitary Association was held on Thursday the 10th inst.—Jonathan Pim, Esq., president of the association, in the chair. Letters of apology for non-attendance were read from Sir A. Guinness, Ion Trant Hamilton, M.P., the Right. Hon. Viscount Monck, Sir Edward Borough, the President of the College of Physicians, and the President of the College of Surgeons. Mr. F. W. Pim then read the third annual report of the Executive Committee, which stated—'The number of members of the association shows an increase of twenty-one as compared with 1874. Your committee have continued to meet regularly once a week. Reports of nuisances have, as heretofore, been forwarded weekly to the Public Health Committee of the Corporation; 347 cases have been thus reported. In many instances it was necessary to bring dangerous nuisances repeatedly under the notice of the authorities before any effectual means were taken to remedy them; and even amongst those cases which have been attended to after repeated complaints, we can scarcely point to one in which the remedy can be considered as more than temporary. In many places which we have again and again reported, our last inspections disclose only a somewhat improved condition.'

After detailing a number of cases of nuisances injurious to the public health, and the action taken by the Sanitary Association to bring them under the notice of the proper authorities and have them abated, the report continues:

'Your committee desire to acknowledge their obligations to Edward Gibson, Esq., Q.C., M.P., for his valuable services in connection with the extension of the Artisans' Dwellings Bill to Ireland. As soon as the measure was introduced into the House of Commons, your committee communicated with the Home Secretary with the object of securing for this country the benefit of the proposed legislation. A petition to the same effect, signed by the president, vice-president, and secretaries, on behalf of the association, was presented to the House of Commons by Mr. Gibson. The Home Secretary ultimately consented to extend the bill to this country, but your committee regret that their suggestions that in Ireland the measure should apply to towns having more than 10,000 inhabitants, was not adopted, but having fixed 25,000 as the limit of population in England, the Home Secretary refused to adopt a lower standard for Ireland.

'Your committee would be glad to be able to hold out to the association a prospect of early success in the task which it has undertaken. Your committee trust, that by persevering effort some gradual amelioration may be

effected in the sanitary condition of Dublin, which, as shown by the report of Dr. Burke, medical superintendent of statistics, General Register Office, *Thom's Directory* for 1875, compares so very unfavourably with the cities and large towns of England and Scotland. Your committee believe that good has already been effected, and at all events they do not doubt that the labours of the association will, if vigorously followed up, lead to considerable success hereafter.'

Dr. Hayden moved 'That the report be adopted.' In doing so he said he regretted exceedingly that latterly it had not been in his power to devote so much time and attention as he would wish to the work of the association, which was of the utmost importance to the well being of Dublin. The association was purely voluntary, and it consisted of a number of gentlemen who had no other object in view than the public good. He was not aware of any word or act of theirs which could possibly give offence to any one. Though their members had increased, the number was too small considering the objects they had in view. With regard to the want of proper conveyance for fever patients to hospital, he could tell, from his experience as a physician, things that would shock the sensibilities of the public. They had everything ready for the proper treatment of fever patients, and yet they had no proper conveyance to take them to hospitals.

Mr. Pim, hon. secretary, seconded the adoption of the report, saying he had much pleasure in doing so. Referring to the reasons for the existence of the association, he said the death-rate in Dublin was really appalling. In comparison with other cities, Dublin ought to be a healthy city, as it possessed good water-supply, and other advantages. Yet the average death-rate in Dublin, including the suburbs for the last ten years was 26·5, while in the overcrowded city of London the average was only 24. They would save 732 lives annually if they would reduce their death-rate to that of London. In the city of London proper, the death-rate was 25·76, while in the municipal boundaries of Dublin it would reach an average of 31, allowing for the defective registration as compared with the more accurate system pursued in England, and hundreds of lives were sacrificed annually because of defective sanitary arrangements. In eighteen months over 1,000 people died from scarlatina, a great many of which deaths might have been prevented if arrangements had been made in time, as suggested by the association. He concluded by an appeal for additional subscriptions, without which the association would be hampered in its efforts.

On the motion of Dr. McDonnell, seconded by Mr. J. R. Wigham, the officers and executive committee were re-appointed for the ensuing year.

Dr. Grimshaw moved the following resolution:

'That the evidence furnished by the recently published report of the Census Commissioners for 1871, the returns of the Registrar-General for the past ten years, and the report upon the sanitary condition of Dublin by Dr. Burke, physician to His Grace the Lord Lieutenant, and Medical Superintendent of Statistics at the General Registry Office, prove that the death-rate of the city of Dublin is excessive, and has continued to be so for a considerable period; and further, that according to Dr. Burke's report and the experience of this association, the sanitary condition of the city is unsatisfactory, and the committee are hereby directed to take such steps as may be necessary to obtain a public inquiry into the causes of this excessive death-rate and the present unsanitary state of Dublin.'

The resolution was seconded by Mr. Beatty, and unanimously passed.

Lord James Butler moved, and Mr. R. O'B. Furlong seconded, the following resolution, which was also passed:

'That this association having learned with deep regret of the resignation of Dr. Churchill of the chairmanship of the executive committee consequent on his retirement from the practice of his profession and intended residence in the country, desires to express its gratitude to him for the valuable services he has rendered to the cause of sanitary reform in Dublin, and for his constant and untiring efforts on behalf of this association.'

Votes of thanks having been passed to the proprietors of the Dublin newspapers and to the chairman, the meeting separated.

The Health of Watering Places.

VI. DOVER.

THE boundaries of the municipal and parliamentary Borough and of the local board district of Dover are co-extensive, and include an area of 1,262 acres. The borough of Dover consists of four entire parishes, and parts of four others. At the first national census, in 1801, the population of Dover, within limits very nearly corresponding with those of the present borough, was 8,028; in 1831 this population had increased to 15,645. The population of the borough of Dover has at the last four census enumerations been returned successively at 19,189, 22,244, 25,325, and 28,506. Since 1801 the Dover population has showed a continuous increase at each census; this rate of increase has, however, declined during the past three decades. Between 1841 and 1851 the increase was equal to 16 per cent., in the next decade it was 14 per cent., and during the ten years 1861-70 it further declined to 13 per cent. From the fact that the borough includes portions of four parishes, there is considerable difficulty in dealing with its vital statistics in an entirely satisfactory manner. The deaths in the workhouse, without a special return showing the domicile of each of the deceased inmates, cannot be correctly apportioned between the municipal and ex-municipal portions of the union. On this account we shall prefer, in dealing with the vital statistics of Dover, to adopt the boundaries of the Union of Dover for the purpose of estimating the sanitary condition of this watering-place.

The union and superintendent-registrar's district of Dover includes, in addition to the borough, a rural area of nearly 28,000 acres, on which a population of 6,743 persons was enumerated at the census of 1871. The inclusion of this rural population probably to some extent favourably affects the death-rate of the district; but as Dr. Robinson, the medical officer of health, pointed out in his annual report for 1873, this effect is but slight. During the year 1874, 1,094 births and 647 deaths were registered within the district of Dover. Assuming that the population of the district has increased since 1871 at the same rate which prevailed during the ten years 1851–70, it may be estimated at 36,534 in the middle of 1874. On this estimated population the births in the year were equal to 29·9 per 1,000, whereas in the ten years 1861–70 it had averaged 31·6 per 1,000. The registered births, both in 1873 and 1874 were considerably lower than in 1871 and 1872; and the low birth-rate in the past two years may certainly be taken as evidence that the population is not under-estimated, even if it be not somewhat over-stated.

Dr. Robinson stated in his annual report for 1873, before-mentioned, that 'Dover was one of the earliest towns to avail itself of the advantages afforded to town governors by the Public Health Act of 1848, and for nearly twenty years has been provided with a complete system of drainage, and a public water-supply obtained from a pure and unquestionable source.' According to the reports of the Registrar-General, the average annual death-rate in Dover district was 21 per 1,000 in the ten years 1841-50, and was 20 per 1,000 in each of the decades 1851-60, and 1861-70. During the three years 1871-2-3 the death-rate in the district was 19·5, 25·2, and 15·5 per 1,000 respectively, while in 1874 the 647 deaths above-mentioned were equal to a rate of 17·7 per 1,000; it appears, therefore, that during the four first years of the current decade the death-rate in Dover district has averaged 19·5, and has been slightly less than the average in the preceding twenty years. The high

rate in 1872 was caused by a severe epidemic of small-pox, which resulted in no less than 247 deaths. The death-rate in 1873 and 1874 showed, however, a marked decline from the average above referred to.

Dover being a garrison town, in which an average number of about 3,000 troops are stationed, the proportion of sexes in the population of the district is somewhat abnormal, and it will be useful to notice the rate of mortality in the two sexes separately. In 1,000 of the population of England and Wales, enumerated in 1871, the males were 487 and the females 513; in the district of Dover the proportions were nearly reversed, as each 1,000 persons at the last census averaged 511 males and 489 females. It is well known that the rate of mortality among males exceeds that among females, and it therefore follows that the death-rate in Dover is unfavourably affected by the abnormally large proportion of males in its population. With the assistance, however, of the figures contained in a paper recently read before the Statistical Society in London, it may be ascertained that the effect of this disturbing element in the Dover population on its death-rate is less than ·03 per 1,000; or in other words that the excess of males in Dover would only account for one death per annum in the population of the district. Assuming that the proportion of the sexes in the Dover population is the same now as in 1871, the estimated population in the middle of 1874 (36,534) consisted of 18,669 males and 17,865 females. The 647 deaths in Dover district during the year included 349 of males, and 298 of females; it follows therefore that the male death-rate was equal to 18·7 per 1,000, whereas the rate among females did not exceed 16·7. According to the English Life Table, the male death-rate exceeds the female rate by 4·8 per cent.; in Dover last year the male death-rate exceeded that among females by 12·0 per cent. This is probably due in some way to the influence of the military population; although, as soldiers are principally of those ages when the rate of mortality is low, it might be expected that the presence of a considerable proportion of soldiers in the male population would have the effect of reducing the mortality at all ages. In endeavouring to estimate the sanitary condition of a town which is a military station, the female death-rate should always afford the most trustworthy basis for observation; and it appears that Dover, judged by its female death-rate, appears in a still more favourable light than if its sanitary condition were estimated from the death-rate of persons alone.

The 647 deaths in Dover district in 1874 included eighty-six, or 13 per cent., which occurred in public institutions. This proportion is unusually large for a district containing a small town and a considerable percentage of rural population. The average proportion of institution deaths in England and Wales in 1874 was less than 9 per cent. The eighty-six deaths in the Dover institutions included seventy-two in the union workhouse, five in the Convalescent Home, four each in the Dover Hospital and the Military Hospital, and one in the Cottage Hospital. It is possible that a few of the deaths in the hospitals were of patients admitted from outside the district; but the seventy-two deaths in the workhouse constitute the most remarkable feature in connection with the deaths in the Dover institutions. The fact that more than 13 per cent. of the deaths registered in Dover district during 1874 occurred in the workhouse is worthy of notice. Whether this unusual proportion of workhouse deaths in Dover be due to excessive pauperism in the union, or to an exceptional mortality among the paupers, can only be ascertained by local investigation. It is sufficient here to state that the percentage of deaths in the Dover Union Workhouse to the total deaths in the district is more than double the average proportion in the whole of England and Wales. It is evident, therefore, that the rate of mortality in the Dover Union Workhouse calls for the notice of the medical officer of health, as it contributes an important factor in the mortality of this district and watering place.

It will be well now to pass to the consideration of the causes of death in Dover during 1874, and in the first place of those of a zymotic character. The 647 deaths registered within the district included twenty-four which were referred to whooping-cough, twenty-one to measles, twenty to diarrhœa, nine to different forms of fever, two to scarlet fever, two to diphtheria, and not one to small-pox; in all, seventy-eight deaths resulted from these seven principal zymotic diseases, against 310 and 31 in 1872 and 1873. These seventy-eight deaths were equal to a rate of 2·1 per 1,000 of the estimated population, and to a proportion of 12·1 per cent. of the deaths from all causes. The death-rate from these diseases in England and Wales during 1874 was 3·6 per 1,000, and the proportion to total deaths was 16 per cent. The zymotic death-rate in Dover last year, although showing a considerable increase upon that in 1873, was low compared with the average rate in England and Wales. Measles was prevalent in Dover in the early part of 1874, and caused thirteen and seven deaths respectively in the first two quarters of the year; and of the twenty-four deaths from whooping-cough, thirteen occurred in the March and ten in the June quarters. The nine deaths referred to different forms of fever included five certified as enteric or typhoid, and four as simple continued fever; they were equal to a fever-rate of but 24 per 1,000, against an average fever-rate of fifty-six in the whole of England and Wales. The mortality from diarrhœa calls for some notice; the twenty deaths referred to this disease included thirteen of infants under one year of age, fourteen of the twenty being returned in the three months ending September, and were equal to an annual rate of but 1·5 per 1,000, against 2·4 in England and Wales, and 3·0 in fifty towns having a population ranging principally between 30,000 and 100,000. In the five watering-places previously treated of in this series of articles the annual death-rate from diarrhœa in the third or summer quarter of 1874 ranged from 2·1 in Yarmouth to 4·9 in Margate; not one of these five watering-places, therefore, had so low a death-rate from diarrhœa as Dover.

The only other class of diseases in Dover which it is important on the present occasion to mention is that which includes all affections of the respiratory organs. In 1874 the deaths referred to diseases of the respiratory organs and phthisis were 197, equal to a rate of 5·4 per 1,000 persons living; the rate from these diseases in London in 1874 was 7·2 per 1,000; whereas in Lowestoft, as we have recently shown, it was so low as 3·8 per 1,000. The death-rate in Dover last year from diseases of the respiratory organs, including bronchitis, pneumonia, asthma, pleurisy, etc., was 3·6 per 1,000, and from phthisis 1·8; in Lowestoft the rates from the same diseases in 1874 were only 2·4 and 1·8 per 1,000 respectively. It would be interesting to know how far the mortality from these diseases in Dover is affected by its military population. Phthisis is by far the most fatal disease at what may be called soldiers' ages, even if soldiers are not peculiarly liable to mortality from phthisis.

During the year 1874 the deaths of infants under one year of age in Dover district were 138, and equal to 126 per 1,000 of the births registered during the year; this rate was 25 per 1,000 lower than the average proportion of infant mortality in England and Wales during the year. Infant mortality in Dover did not show the increase during the summer quarter of the year which was conspicuous in most of the watering-places previously referred to. The deaths of infants under one year of age in Dover ranged from 39 in the first, to 29 in the last quarter of the year; the 138 in the year included 32 from zymotic diseases, 24 from diseases of the respiratory organs, 13 from premature births, and 36 were returned under the somewhat indefinite headings of thrush, convulsions, atrophy, and debility.

The enumerated population of Dover district in 1871 contained a proportion of 8·3 per cent. of persons aged upwards of 60 years. If the proportion of persons living at these ages continues the same as in 1871, the number of persons aged over 60 in Dover in the middle of 1874 was

3,039; and as the deaths of 191 persons at these ages were registered, the rate of mortality was equal to 62·8 per 1,000. This rate was 9·2 per 1,000 below that which prevailed in England and Wales during 1874. In the five other watering places previously mentioned the death-rate among persons aged sixty years and upwards ranged between 56·6 in Lowestoft and 65·1 in Yarmouth. The proportion of persons aged upwards of sixty years in 1,000 of the population of Dover in 1871 exceeded by ten that which prevailed in the whole of England and Wales; but the effect of this excess of elderly persons upon the death-rate was more than counterbalanced by an excess of 37 persons in each 1,000 at the age of 20 to 40, and a deficiency of 12 between 40 and 60.

During the first three months of this year 168 deaths were registered within Dover District, which was equal to an annual rate of 20·4 per 1,000 upon the population estimated to the middle of the year at 36,939. This rate was no less than 5·3 per 1,000 lower than the average rate during the same period in the ten millions of persons living in the small towns and country parishes of England and Wales. Only two deaths in Dover were referred to the seven principal zymotic diseases, namely, one each to scarlatina and diphtheria. The deaths of persons aged sixty years and upwards registered during the first three months of this year were 82, and exceeded by 16 those returned in the same period of 1874; and yet the low death-rate from the principal zymotic diseases (0·2 per 1,000, instead of 3·6 in the first quarter of 1874) caused the annual rate from all causes to show a decline of 2 per 1,000 in the three months ending March 31 last, compared with that which prevailed in the same period of last year.

According to Dr. Robinson's quarterly report for the three months ending June 30 last, with a copy of which we have just been favoured, the death-rate in the borough of Dover during those three months was as low as 15·8 per 1,000, including fourteen deaths in the workhouse. Only six deaths were referred to the seven principal zymotic diseases, against eighteen in the corresponding period of last year.

The conclusion to be deduced from the foregoing analysis of the most recently published vital statistics for Dover is, that the health of this watering place is satisfactory, and has shown a marked improvement in the past two years, which, judging by the figures for the first half of this year, appears likely to be maintained during 1875. The sanitary authority for the borough is provided with hospital accommodation for the isolation and treatment of cases of infectious diseases to the extent of eighteen beds, in addition to a similar hospital on the workhouse premises, but detached therefrom. It is evident, moreover, from recent action of the town council with regard to the condemnation of unsanitary house property, that the efforts of a zealous medical officer of health meet with ready support from the responsible sanitary authority for the borough. In the case of Dover the sanitary superintendence of the rural parishes around the borough is vested in the medical officer of health of the borough, although there is some doubt whether his recommendations are as promptly carried out by the Dover Union rural sanitary authority, as by the urban authority.

More or less familiar for centuries, though all travellers have been with Dover on their way to and from the continent, and comfortable old town though Dover is, it has never been much of a health resort or watering place. It is built in the valley of the Dour, and sweeps in a circle towards the rock on which the castle stands. It is exposed to the east winds, though somewhat screened from the north-east. The best houses are along the marine parade and behind it, and those most sheltered are the ones nearest the castle hill. There is no shelter, however, that is sufficient for pulmonary invalids. Dover is quite a garrison town, and is one of the few places in England where the military appear to form any noticeable amount of the population. Though colder than St. Leonards, Dover is a very fair winter residence, and seems to be liked by families. Living is not expensive, and the presence of the military always leads to a certain amount of amusement, especially for the young—balls and instrumental music being to be had in abundance. The chief objects of interest are the castle with its ancient tower and chapel. There are also several curious old churches in the town. The fortifications are well worthy of examination, and Shakespeare's cliff is visited by every one. To enjoy Dover you ought to be a good walker, as in every direction you must ascend if you are to take in the wide sea prospects. But the majority of people must be content with the marine parade, or that never-ending source of amusement—the pier, where loungers are able to survey, with a calm feeling of superiority, the hurried and bustling passengers who are embarking, or the pale faces of those who are returning, after having just gone through the ordeal of sea-sickness. It is indeed most disappointing to find that the two last efforts to relieve the misery of passengers, seem to be doomed to prove abortive. The *Castalia* has apparently never had a fair trial, because she is deficient in force to propel her. The *Bessemer* has been unsatisfactory, because her bulk makes her unmanageable; and special arrangements would require to be made at Calais to meet her peculiarities; and, further, because the ingenious arrangement which was to make her saloon swing like a hammock, has hitherto proved a failure. The Lord Warden Hotel serves much the same purposes as the Granville, at Ramsgate, but has not the same advantages of elevation above the sea. The sea-bathing at Dover is not good; for the shore is shingly and unpleasant, and the water deepens too suddenly to make it safe for careless bathers. There are some bathing-machines, in which, however, it is difficult to use horses; and there are salt-baths to be got on shore.

Though Dover is not a place to be selected for sea-bathing, still it is possible to bathe there; and as the season for sea-bathing is now come, we may do worse than give here a few general hints on the subject.

People going to the sea-side are often very careless about their lodgings. They think that they are only going for a few weeks and that it matters little where they live. As, however, they go for health as well as for a holiday, common sense ought to prevent their selecting an obviously insanitary locality; but we believe that a still greater mistake than one about locality is that of overcrowding. People say that they can put up with any accommodation for a few days, forgetting that the greatest evils spring from too many human beings crowding into a limited space, especially in the case of zymotic diseases. The appetite at the sea-side is usually good and the living should be generous. Popular though sea-bathing is among the English, we believe that they seldom consult medical men on the spot as to the best way of using it. Some individuals, and the great majority of them, take very readily to the sea, but there are a few who have an innate repugnance to it, and for whom the cold of the water and the shock of the waves are really in the first instance too much. Such persons may be prepared for the sea, by first having wet cloths applied to them, and being well rubbed when they are taken off; next they may try warm douches, and alternations of hot and cold ones—then they will be able to have cold douches, and when they can bear them, the next step to the open sea is but a small one.

Children sometimes require a good deal of management. It is too frequently the habit to terrify them by ducking or immersing them against their will. As no class of patients gain more by sea-bathing, so it is to the last degree undesirable to frighten them. As a general rule they ought to be six or seven years old. You should not force children to bathe against their will! first let them play on the sands, then encourage them to paddle in the water, next let them see other children bathe, then give a short, single dip, instead of the three or four, which it is thought necessary to administer, and a child will soon come to like the sea. In the case of very nervous women and children,

they should always have the woman of the bathing-machines to assist them; and in France, where bathing-machines are less common, and where male guides are abundant, the services of one of the latter are found to be very re-assuring. We have, indeed, seen a lady dressed in a very picturesque costume, with gold bangles on her arms, enter the sea with a guide, dance about in the water for a quarter of an hour, and return without her guide having been able to persuade her to immerse her head. Every one knows that the proper course, on entering the sea, is to dip the head without any delay.

As to the hour for bathing, some make it a point only to bathe when the tide is coming in; if so, they must change their hour constantly. But, for the great majority of people, bathing before breakfast is most convenient. The strong do not require to take anything before bathing, but weak and nervous people may be allowed a light breakfast first, or a cup of tea or coffee will do no one any harm. In the case of some delicate people, or of those who have an inveterate prejudice against early rising, it may be better to bathe in the forenoon when the air is warmer, and the difference of temperature between the air and the water is less.

When we talk of sea-bathing, we are thinking of its more purely curative action, and do not allude now to the general hygienic action of bathing and swimming combined, when the exercise of swimming keeps up the heat of the system, and makes it safe to prolong a bath. Those who are going to bathe should warm themselves by a short walk, and should never enter the sea feeling cold. Patients should commence bathing, if possible, on a fine day. As a rule, baths should be made as short as possible. Patients, if they like bathing, are almost sure to err on the side of staying in too long. The first effect of a cold bath is to repel the blood from the skin, and to produce congestion of the internal organs. When the bath is over, the blood returns to the surface, and this is what is called reaction. The more prolonged the bath is, the longer will reaction be in taking place, and nothing can be more disagreeable than the shivering feeling, when reaction is slow and imperfect. If you are to be very prudent, you should, on the first day, quit the sea after a single dip, gradually increasing the duration of the bath each day by a few seconds, till it lasts three to five minutes. The duration of the bath should be proportioned to the particular case, and to the state of the weather. If the sea is rough, and there is much wind, the bath should be curtailed. You should speedily regain your bathing-machine and have the skin well rubbed. It is not unusual, especially among the French, to take some slight stimulant on returning from the sea, or to bathe the feet in hot water; neither practice is necessary or desirable in ordinary cases.

It is impossible to say beforehand how many baths may be required for the cure or alleviation of an ailment; for many people twenty to twenty-five are sufficient: others may require fifty or sixty, in which case it is better for the patient to make a break and go away for a time in the middle of his bathing. Sometimes, as in the case of children, two or three successive seasons may be required. Some patients think to shorten the course by bathing twice a day; but this is not a practice to be recommended. In most people it does great harm. Some, however, who cannot bear two baths, may be all the better for a bath and a douche daily.

Patients may take sea-baths almost at any season when the weather is fine; but by common consent on our shores the chief bathing is from the end of June to the middle or end of September.

AT Guildhall, R. Fisher, a horse-slaughterer, of St. Augustine's, Norwich, for sending the carcases of a sheep and pig to the Metropolitan Meat and Poultry Market which were diseased and unfit for food, has been fined *20l.*, with *3l. 3s.* costs.

Parliamentary Proceedings.

HOUSE OF COMMONS.

(*Thursday, July* 8.)

POLLUTION OF RIVERS.

ON the motion of the Marquis of Salisbury, the report of amendments to the Pollution of Rivers Bill, with further verbal amendments by the Duke of Buccleuch and other noble lords, was received and agreed to.

COLLEGE OF SURGEONS.

THE Medical Acts Amendments (College of Surgeons) Bill was, on the motion of Lord Selborne, read a second time.

(*Saturday, July* 10.)

LOCAL GOVERNMENT BOARDS.

THE Local Government Boards Provisional Order-Confirmation (Aberdare, etc.,) Bill passed through coms mittee.

POLLUTED WELLS.

MR. MACDONALD asked a question as to the impurity of wells constituting the chief source of the water-supply of Hucknall Torkard, in Nottinghamshire.

Mr. Sclater-Booth said that, as the published statements were reported to have been made by the chairman of the Sanitary and Improvement Committee, it was to be presumed he would do all in his power to remedy the condition of things he described. The attention of the Local Government Board was drawn to the subject last year by the report of the medical officer of health for the district, and the local authority was informed by his direction that it was its duty to provide a proper water-supply for the district, and until it was provided to look to the existing sources of supply. It appeared expedient that the local authority should join with others in a combined scheme, and an engineer's report thereon was received a fortnight ago. As it involved an expenditure of 50,000*l.* or 60,000*l.*, it could not be said as yet there had been undue delay. Hereafter, in case of neglect, it would be the duty of the Local Government Board to interfere, and if it met with disobedience, which he had not the slightest reason to apprehend, to apply to the Court of Queen's Bench for a *mandamus*.

(*Monday, July* 12.)

ADULTERATION OF MILK.

DR. CAMERON asked the Secretary of State for the Home Department whether his attention had been called to a report in the *Times* of July 3, from which it appeared that Mr. Balguy, the presiding magistrate at Greenwich Police Court, had publicly announced that, after consultation with his brother magistrates, he had resolved not to impose fines in cases of the adulteration of milk with water when such adulteration was not over 10 per cent.; and whether the Adulteration Acts now in force warranted magistrates in allowing the adulteration of milk with water if not practised to a greater extent than 10 per cent. to pass unpunished.

Mr. Cross: I believe it is the fact that Mr. Balguy did make such a statement after consulting with his brother magistrates, but I cannot say how many magistrates he consulted with; but I do not think his view of the law would be acquiesced in by my right hon. friend the President of the Local Government Board, either with regard to the Acts now in force or the bill now passing through the House.

Law Reports.

BRIEF NOTES OF RECENT DECISIONS.

FOR some reason or another litigation on public health and Local Government subjects in the superior courts at Westminster and Lincoln's Inn is on the increase. The decisions are for the purposes of the professional lawyers reported at stated intervals in various legal publications especially in the *Law Journal*, the *Law Reports*, the *Weekly Notes*, the *Law Times*, and the *Justice of the Peace*. A few of the decisions, and those often the least important, are recorded from time to time in a haphazard manner in the daily newspapers; but we have long been of opinion that it would be of great use to many of our readers if we presented them not simply with notes of important legal decisions, but also with references to the legal periodicals where they would be able to find the arguments of counsel and the opinions of the judges set out in full. It frequently happens that several months elapse between the delivery of a judgment and the publication of it, even in one, much less in all five of the above-named legal journals. In cases where inordinate delay seems likely to supervene, we shall give a reference to the *Times* newspaper, the law reporting of which is usually done in a very trustworthy manner.

The cases in the police courts we shall give as heretofore, because no more formal record of them can be procured than what the daily papers supply us with, and the issues raised in them are commonly of lesser moment.

RIGHTS AS TO DRAINS.

1875. *Finlinson* v. *Porter*. 'Public Health Act, 1848,' sec. 49; 'Local Government Act, 1858,' sec. 34.—Conveyance of Rights as to a Drain—Drain altered by Defendants on the Demand of the Local Board—Action of Trespass—Judgment for the Defendants. (44 L. J., Q. B. 56; L. R. 10, Q. B. 188; 32 L. T. 391.)

FIRE ENGINE.

1875. *Lewis* v. *Arnold*. 'Towns Police Clauses Act, 1847,' sec. 33.—Expenses of Fire Engine attending a Hay Stack on Fire—Held that the Owner of the Stack, being the Occupier of the Land, was to be deemed, for the purposes of the section, 'the owner of the land'—A Hay Stack is not a 'building.' (44 L. J., M. C. 69; L. R. 10, Q. B. 245; 32 L. T. 553; 39 J. P. 294.)

SEWER CLEANSING.

1875. *Nuneaton Local Board* v. *General Sewage Company*.—Lease of Town Sewage and Works to a Public Company—Neglect to Perform the Covenants—Injunction Granted to Restrain the Defendants from keeping Sewage Matter in the Town Sewers, followed by a second Injunction to Restrain them Pouring the Sewage into a River. (L. R. 20, Eq. 127.)

BORROWING ON SECURITY OF RATES.

1874. *Reg.* v. *Wigan Churchwardens*. 5 Geo. IV. c. 36, sec. 1.—Loan by Public Works Commissioners on Security of Rates—Neglect by Borrowers for Twenty Years to Repay any Principal or Interest—Held that the Commissioners had lost their Remedy. (L. R. 9, Q. B. 317.)

IMPORTANT DECISION AS TO TRADE REFUSE.

IN a case which recently came before the Clerkenwell Police Court, in which a dust contractor was summoned for the non-removal of ashes from engines employed in their factory, the question was raised whether the material which the defendant refused without payment to take away from the complainant's premises was refuse of trade or not? Mr. Cook, in giving judgment, said it is unnecessary to determine whether a manufactory comes within the meaning of the words 'a house or place,' I should otherwise decide that it does; nor, indeed, whether it is necessary that the complainant should reside at the premises, for the Act uses the word 'owner' as well as 'occupier.' The terms 'place' and 'owner' enlarge the operation of the Act. Upon the question whether the ashes from the engines employed in this factory and on the adjoining premises are or are not 'refuse of trade,' I decide that they are not, and must be removed by the contractor without extra payment by the owner of the premises. I may observe that on what I have called the adjoining premises there is no factory at all, but an engine now used by the complainants to supply motive power to carry on trades by other persons in the same place. The ashes here could hardly be considered refuse of any trade. Then, as to the premises where there is a factory, it is proved that the ashes from domestic purposes are mixed with those from the engine, and the whole carefully kept distinct from any deposit or materials used in the factory. The contractor is therefore, I think, bound, under his contract with the parish, to remove these ashes.

Correspondence.

A LIVERPOOL SUBURB.

(*To the Editor of the* SANITARY RECORD.)

SIR,—Being a resident of, and interested in, the township of Huyton-cum-Roby, I was glad to see your article, in the RECORD of last Saturday, under the head of 'A Liverpool Suburb,' and I wish to add a few remarks as to its salubrity and sanitary condition.

Huyton-cum-Roby is situated six or seven miles from Liverpool, on the Manchester and Liverpool old line; stands on a hill 100 feet above the level of the sea; is within one mile of Knowsley Park and Prescot; has extensive views of open country all round, and no manufacturing or other objectionable works carried on within a radius of five or six miles, save and except one or two coal-pits on the outskirts of the township; it is supplied plentifully with pure water from Rivington Pike (for which we have to thank the late Lord Derby), and is purely a residential suburb of Liverpool. The air is mild and bracing, so much so that the medical profession of Liverpool and district recommend their phthisical patients to it for change of air, which is a strong proof of its healthiness; vegetation is about as forward here as in the south of England, and we have some of the best agricultural land and most productive in the country.

But it is well known that the district has outgrown its sanitary arrangements. A large number of first-class houses have been built within the last ten years; the assessment nearly doubled within a very short period. All the sewage goes directly or indirectly into open ditches and water-courses, and consequently the place is less healthy. But the inhabitants are now fully alive to this defect, are working vigorously with a parochial committee under the rural sanitary authority of Prescot union, and are determined to have a thorough and complete system of sewerage. With regard to the disposal of the sewage, they, like most other authorities, are puzzled as to the best course to adopt. What course or process would you suggest for a rural population of 3,500, and likely to be 5,000 before the next census is taken?

With regard to the mortality of the township, I submit that the usual way of calculating the death-rate in any place where invalids are sent from other places to die, cannot be a fair or reasonable test of its healthiness; and if the usual statistics were divested of the deaths arising from these birds of passage, I am confident the death-rate from ordinary residents would prove the lowest in any township or village within a circuit of fifty miles. The unusually high death-rate for the month of May—namely 36·67, or ten deaths—was quite abnormal, and arose from the deaths of four infants in Huyton Quarry (a detached part

of the township), one from consumption, of a non-resident, and one from zymotic disease. The deaths in April were four, or 14·62 per 1,000, and some months there are no deaths. HUYTONIAN.

Huyton, July 8, 1875.

SPREAD OF SMALL-POX BY PAPER RAGS.

(*To the Editor of the* SANITARY RECORD.)

SIR,—*Apropos* of the communication in your last week's number on the above subject, it may prove of some interest to your readers to hear of a similar outbreak to that narrated by Dr. F. B. Lewis, and which was the subject of recent investigation by Mr. Hutchins (the medical officer of health for Canterbury) and myself, commencing, as the outburst did, in Mr. Hutchins's district, and extending subsequently into my own.

From inquiries instituted by Mr. Hutchins, it was disclosed that early in May last the inmates of a certain house in Canterbury were suffering from small-pox, which had commenced in a girl who worked in a rag-warehouse; the fact was at first concealed, and it was not until two other young women, who also worked at the same warehouse, were simultaneously attacked by small-pox, that the explosion became known to the sanitary authority.

Subsequently to the occurrence of the first case, as above named, twenty other cases have been discovered, fourteen within the city of Canterbury (including three deaths) and six cases in one of my rural districts, all of which, through various channels of communication, have been clearly tracked home to their common origin—namely, the rag-warehouse in question. So patent indeed was the revelation made, that when I called with Mr. Hutchins at the infected manufactory, I found, *mirabile dictu*, the manager himself fully prepared to admit the correctness of the conclusion arrived at.

I venture to submit that the above well-authenticated history is instructive, as illustrating the potency for mischief of mediate sources of contagion—to wit, infected clothes; and showing also the necessity that exists for causing all rag-dealers to submit their obnoxious wares to some purifying process, such as exposure in a chamber of dry heat or sulphurous acid, before they are committed to the hands of the unfortunate rag-pickers for sorting and cutting. M. K. ROBINSON, M.D.,

Medical Officer of Health, East Kent.

Dover, July 13, 1875.

BUTTER FATS.

(*To the Editor of the* SANITARY RECORD.)

DEAR SIR,—In the recent 'butter case' at Lambeth Police Court, Dr. Bernays found 94 per cent. of fixed fatty acids; this I gather from a report of the case given in your last number.

Under 'Notes of the Week' you say, 'We cannot regard the case as having been satisfactorily proved.' May I, in the interests of public analysts, and of your general readers, ask why you give this as your editorial opinion?

ARTHUR ANGELL,
Hants County Analyst.

[The proposition that perfectly dry butter-fat yields very much less fixed fatty acids than the fats liable to be confounded with butter, does not appear to us to be sufficiently well established; and the recent butter case in Lambeth depended upon the validity of that proposition. Hence the objection to which our correspondent refers.]

THE HEALTH OF COVENTRY AND THE SEWAGE WORKS.

(*To the Editor of the* SANITARY RECORD.)

SIR,—Mr. Melliss, engineer to the General Sewage and Manure Company, has called my attention to an article published in your issue of June 26, in which certain statements derogatory to that company's works at Coventry are made.

The article being a review of a report of mine, the statements would appear to form part of my report. This I have denied to Mr. Mills, as I never mentioned the company in any of my quarterly reports. I stated in a letter to you, enclosing the report, that the company's drying apparatus was insufficient, and a nuisance thereby arose; but I cannot believe that my statement was the ground upon which you founded the report, as my statement was made last year. It was true at that time, but the company since then have put the works in efficient working order, and made such additions to them, that the sewage is now purified to a standard which I do not believe is surpassed by any other system as yet known.

With regard to the report itself, I must say that I think the publication of it was very unfair indeed towards Coventry; inasmuch as there is no date to it, your readers would naturally infer that the bad state described is the existing state of things. More especially is it unfair, as a more recent report was criticised in your issue of February 13, and we have been up to the present time in a very good sanitary condition. Few deaths or illnesses have occurred from zymotic disease, which you will see from my next report, which will be sent to you in a few days.

M. A. FENTON, M.D.
Medical Officer of Health, Coventry.

[We are glad to publish the above letter, as it shows the marked improvement which has been made in the sewage system of Coventry within the past year, since the General Sewage Company's works have been in full operation. Dr. Fenton admits that at the time he wrote his report, twelve months since, the drying apparatus was at that time inefficient, and a nuisance thereby arose. We have ourselves visited the sewage works in question recently, and in our reports have testified on several occasions to the efficient manner in which the sewage of that town is deodorised and utilised to the utmost in the most inoffensive and practical manner.]

Review.

Lectures on Public Health, delivered in the Lecture Hall of the Royal Dublin Society. Pp. 203.

THE ten lectures, here collected into a volume, were delivered as an afternoon scientific series, under the auspices of the Royal Dublin Society and a Sanitary Association recently formed for promoting a knowledge of Public Health. Although popular in form, and addressed to lay audiences, they are full of information, and will well repay an attentive study. Some indeed might be thought somewhat too solid and too statistical for the occasion, but this is a fault on the right side, and may well be condoned in consideration of the undoubted merits of the volume. Ireland has been strangely neglected as regards sanitary legislation, but much is now being done to recover lost ground, and Trinity College, Dublin, has been the first of all our Universities to establish a qualification in State Medicine. Nothing could be better calculated to develope the sanitary sense and inform the people on public-health matters than a course of lectures such as those now before us, and the Royal Dublin Society has been fortunate in securing as lecturers men whose position and experience entitles them to a hearing.

The introductory lecture of the series is by Dr. W. Stokes, 'a mere chalk outline of a great subject, bringing into relief such points as relate especially to the health of the city of Dublin;' but graphic in

its details and well calculated to rivet the attention of an audience. The reader of English Blue books is familiar with suffering caused by sanitary neglect, but where could he find a parallel to the case of Cork workhouse, quoted by Dr. Stokes, in which, from December 1846 to April 1847 there died no less than 2,130 persons, in which 'the inmates were put three, four, and five in a bed, and in the convalescent ward there were 44 beds for 125 persons!' Where, again, could he match the case of the emigrant ships, to which, in 1847, the poor panic-stricken souls, flying from the pestilence on land, had betaken themselves in crowds? At the lowest computation, 74,539 emigrants embarked, and the mortality was greater than on shore; 5,293 died on the passage, 8,000 reached America in fever, and 'if the number of those that died at sea be added to the deaths in the quarantine hospitals, there is a total of 9,786 deaths.' Passing to consider the forces antagonistic to sanitary improvement, Dr. Stokes believes them to be 'poverty and destitution with their long train of evils, ignorance, apathy, insufficient and improper food, filthy habits, overcrowding, bad ventilation, insufficient clothing, the living in ruined and neglected tenements, the destruction of proper pride, and the blessed influence of home.' The death-rate in Dublin is 26·28, due doubtless to partial and localised overcrowding. In Dublin there are on an average seven person less per acre than there are in London, but there are upwards of 1,000 houses unfit for human habitation, and here is a description of one of them:—'A house containing eight rooms was reported as containing ninety-five inhabitants, that is, nearly twelve for each room, and I know a gentleman who visited that very house in 1870, and found sixteen human beings living in one wretched room.' The second lecture by Professor Reynolds on the 'Discrimination of Good Water and Wholesome Food,' is eminently practical; the rules for detecting common adulterations being simple and adapted for home use.

Lecture III. is an elaborate essay by Dr. Moore, Diplomate in State Medicine, on 'Meteorology in its bearing on Health and Disease.' A curious fact comes out about measles, which seems to corroborate the conclusions of Dr. Ballard, that a temperature below 42° Fahr. is as unfavourable to the spread of the disease as a temperature above 59° Fahr. We are surprised that Dr. Moore has made no use of the very voluminous meteorological observations in the reports of New York and Philadelphia; he has, however, borrowed largely from Professor Faye of Christiania, and his paper represents very fairly the present extent of our knowledge on the subject. Following Dr. Moore, we have a paper by Dr. Little on the 'Geographical Distribution of Disease.' He adopts Keith Johnson's isothermal divisions, and the greater portion of the lecture is taken up with very interesting particulars respecting the home of cholera in Lower Bengal, and a short sketch of the various routes by which it has found access to Western Europe.

'Zymotic and Preventable Disease' is the title of a lecture by Dr. Grimshaw, in which many of the most interesting points of sanitary medicine are ably discussed. His conclusions on some points will be disputed, nor do we think they are quite borne out by the evidence; but they are worth attention as being the result of extensive observation and earnest thought. Simple fever, for instance, he regards as an abortive attempt at either typhus or typhoid. In his opinion, regarding the origin of typhus *de novo* from overcrowding, and that of typhoid from decomposing sewage, Dr. Grimshaw is at one with English sanitarians; but the American theory which he adopts, of the origin of measles from musty straw and from linseed meal is not so universally accepted. Nor do we think it quite conclusive that scarlatina arises from decomposing slaughter refuse, as Dr. Carpenter and others have supposed. We would gladly have given Dr. Grimshaw's account of a fever nest, but we must refer our readers to the book itself. It is somewhat surprising to find that in spite of poverty and filth, of endemic fever and appalling epidemics, that one-fifth only of the total mortality in Ireland is due to epidemic disease, whereas in England and Scotland quite one-fourth is due to this cause. This comparative immunity Dr. Grimshaw attributes to the excellent poor-law medical service, whose organisation is in many respects incomparably superior to our own.

Lecture VI. on 'Liability to Disease,' by Dr. Hudson, is disappointing. An indefinite title has probably lead to desultory and discursive treatment. Some of his conclusions are certainly open to discussion; we cannot see, for instance, that the liability to zymotic disease is more inherent in our constitution than the liability to break our limbs, nor should we have supposed that 'all scientific hygienic measures are based upon their power of preserving or restoring the healthy condition of the factors of nutrition, and neutralising the conditions, whether extrinsic or intrinsic, by which this function is impaired or deranged.'

Lecture VII, by Dr. Macdonnell, on 'Antiseptics and Disinfection,' contains a fair *résumé* of the opinions held by Pasteur, Pouchet, Tyndall, and others, on germs—but we look in vain for practical hints on disinfection.

Dr. Mapother's large experience as medical officer of health for the city of Dublin, enables him, as might be expected, to give sound and very practical hints for the 'Prevention of Artisans' Diseases.' Most of the facts he mentions will be familiar to readers of Mr. Simon's blue books, but they bear repeating. Dr. Mapother pleads eloquently for a codification of the factory acts, under which seamstresses are earning in Dublin 3*s*. a week and living on it—for more holidays and reasonable hours of work. There are two inspectors only for all Ireland, and what can be done by a staff so limited? We think the trades' unions might have something to say to Dr. Mapother's suggestion, that a man should be punished who absents himself from work on a Monday.

Lecture IX., by Mr. Henderson, architect, is a thoroughly sound, easily understood, and practical paper on house construction, well worth reading by officers of health and others who are liable to be consulted about domestic sanitary arrangements. The portions on warming and ventilation are especially valuable, and we are glad to see that Mr. Henderson is an advocate for cottage squares in place of the blocks now being constructed by the Industrial Tenements Company and the Peabody Fund, for the poor of our large cities.

The last lecture in the volume is by R. Furlong, Esq., on 'Sanitary Legislation,' especially in its relation to Ireland. He has no difficulty in showing the marked exclusion of Ireland from some of the most useful enactments passed by the Imperial Parliament. The Act for Registering Births and Deaths,

for instance, became law in England as early as 1836; in Ireland not until 1864. The Public Health Acts of 1848, 1858, and 1872, were for England and Wales only. The same may be said of the Royal Sanitary Commission, which actually originated in a meeting of the British Medical Association at Dublin, and to which most able representatives were chosen from Scotland and Ireland.

According to the account before us, Irish sanitary law seems to surpass the English code in the confusion and multiplicity of its statutes. By-laws, having the force of law, are often found in conflict with the general law of the land; and in Dublin a large variety of local Acts, by-laws, and regulations, besides about seventeen general Acts, must be searched if a question of public health has to be settled. Mr. Furlong may well ask in despair 'how the law can be effectively administered when its provisions are scattered over some fifty or sixty statutes, some self-contradictory, others obsolete, and all of them vague and loosely worded?' The results, as might be imagined, are all but universal neglect; of ten corporate towns with an aggregate of 409,000 inhabitants, four spent nothing on sanitary improvements, and the remaining six only 2,390*l.* between them. Even in Dublin, where there are evidences of sanitary activity, the total sum spent by the Public Health Committee in 1871 was only 2,050*l.*, nearly 1,000*l.* less than was expended upon the fire-brigade during the same period.

We should have been glad to quote more largely from this very interesting paper, but we can only find space for one word of warning to sanitarians who rely on the death-rate as a test of sanitary condition. Mr. Furlong informs us that in the Dublin district during the year 1872 the number of interments exceeded the registered deaths by 1,083, and four deaths from small-pox registered in the week ending November 22, 1873, occurred in January of the previous year!

Now that the public mind is awakening to the paramount importance of preventive medicine, we shall probably see the growth of an extensive literature connected with the subject; and we welcome the Dublin lectures as a valuable contribution to the library of the sanitarian and of the medical officer of health.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

BERKELEY, Cuthbert, Esq., has been appointed Chairman of the Whickham Urban Sanitary Authority.

BOTHWELL, George Granville, L.R.C.P. Edin., M.R.C.S. Eng., L.A.H. Dub., L.S.A. Lond., has been appointed Medical Officer of Health for the Leighton Buzzard Rural Sanitary District.

COGAN, Philip Edmund, M.D.C.M. Qu. Univ. Irel., has been re-appointed Medical Officer of Health for the Allerton Urban Sanitary District, Yorkshire, his term of office having expired on May 1.

COX, Mr. Samuel, Inspector of Nuisances for the Falmouth Rural Sanitary District has been appointed Surveyor also.

GRAY, Frederick Archibald, L.R.C.P. Lond., M.R.C.S. Eng., has been appointed Medical Officer of Health for the Ottery St. Mary Urban Sanitary District, vice Morrell, resigned; 80*l.* per ann.; acreage, 9,944; population, 4,107.

HEAPS, Mr. James, has been appointed Collector to the Long Eaton Urban Sanitary Authority.

ISMAY, Mr. Thomas, has been appointed Collector to the Whickham Urban Sanitary Authority.

LAMBERT, Mr. Thomas, has been appointed Clerk to the Whickham Urban Sanitary Authority.

LITHGOW, Robert Alexander Douglas, L.R.C.P. Edin., L.R.C.S. Edin., L.S.A. Lond., has been appointed Certifying Factory Surgeon for the Wisbech District, vice Maynard, resigned.

MASSICKS, Thomas, Esq., has been appointed Chairman of the Millom Urban Sanitary Authority.

SUDDELL, Mr. Peter, has been appointed Surveyor and Inspector of Nuisances for the Westhoughton Urban Sanitary District: 75*l.* per ann.

SUTHERLAND, Mr. G., has been appointed Inspector of Nuisances for the Mirfield Urban Sanitary District.

VACANCIES.

CARDIFF RURAL SANITARY DISTRICT. Inspector of Nuisances. Application to W. P. Stephenson, Clerk to the Authority.

GATESHEAD-ON-TYNE. Certifying Factory Surgeon.

SELBY RURAL SANITARY DISTRICT, Yorkshire. Inspector of Nuisances: 80*l.* per ann. Application, 24th instant, to Charles Newstead, Clerk to the Authority.

ST. GEORGE URBAN SANITARY DISTRICT, Gloucestershire. Medical Officer of Health: 50*l.* per ann. Inspector of Nuisances: 40*l.* per ann. Applications, 20th inst., to Albert Essery, Clerk to the Authority, Guildhall, Bristol.

PRESTON. Town Clerk, Registrar of the Borough Court of Pleas, and Clerk to the Urban Sanitary Authority: 850*l.* per. ann., fees amounting to about 140*l.* per ann., office accommodation, stationery, etc. Application, 28th instant, to Robert Ascroft, Town Clerk

WHICKHAM URBAN SANITARY DISTRICT. Medical Officer of Health: 50*l.* per ann. Surveyor and Inspector of Nuisances, 130*l.* per ann. Application to Thomas Lambert, Clerk to the Authority.

SANITARY PATENTS.

2125. An improved apparatus for extracting the essence of meats, especially applicable for domestic and medicinal use. Alfred Philip Wire and William Gostwyck Gard, Dunstable, Bedfordshire.

2307. Improvements in the treatment, preparation, and preservation of substances or bodies for dietary and medicinal uses and sanitary purposes (partly applicable in the arts), and in the processes and machinery or apparatus for effecting the same. Thaddeus Hyatt, Gloucester Gardens, Hyde Park, London.

2319. Improved means for ventilating tunnels and other similar structures and places. Joseph Dixon, Chancery Lane, London.

2035. Treatment of gases and fumes. Brereton Todd, Victoria Square, Newcastle-upon-Tyne.

1996. Disinfecting and deodorising apparatus for water-closets, etc. John Morcombe Bromley Baker, Lennox Road, Southsea, Hampshire.

ABSTRACTS OF SPECIFICATIONS.

4284. Distributing manures. G. Greig, Edinburgh.

According to this provisional specification the body of the wagon runs on rollers on the bed frame until the centre of gravity overhangs, and it then tips. To distribute manure a roller with pegs on its periphery is employed to draw the manure forward to the point of delivery. The pegs are protruded by an eccentric at the place where they are required to act, and they are drawn back into the drum to clean them, and allow the surface of the drum to be scraped by means of a fixed scraper.

4305. Treatment of sewage. H. Y. D. Scott, Ealing.

The object of this invention is the treatment of sewage in such a manner as to deodorise its fertilising constituents without degrading their value. The process is applicable to town sewage as well as to solid fæces. By the mode of treatment now proposed, the carbonat e of lime precipitate obtained being unmixed with siliceous and agillaceous particles can be reburned and reused for the precipitation of fresh portions of sewage.

Communications have been received from:

Dr. Edward E. Phillip, Southend; Mr. Hutchins, Weston-super-Mare; Dr. Chas. Ashenden, Hastings; the Medical Officer of Health, Bognor; Dr. Taafe, Brighton; Dr. W. Bateman, Folkestone; Dr. J. Nicol, Llandudno; Dr. Pullin, Sidmouth; Dr. F. Ferguson, Bolton: Dr. M. K. Robinson, Dover; Mr. G. W. Wigner, London; the Medical Officer of Health, Margate; Dr. Henry H. Vernon, Southport; Dr. John Macpherson, London; Messrs. Tillotson and Son, Bolton; Dr. T. W. Grimshaw, Dublin; Dr. De Chaumont, Woolston; Mr. Francis George Heath, Hackney; Dr. Milner Fothergill, London; the Secretary of the Dublin Sanitary Association; Mr. Arthur Angell, Southampton; Dr. Hugh James Lloyd, Bournemouth; Mr. Samuel Rhind, Torquay; Mr. N. A. Humphreys, London; Mr. G. F. Chambers, Eastbourne.

NOTICE.

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Original Papers.

FACTORY CHILDREN.

BY DR. FERGUSON, CERTIFYING SURGEON, BOLTON.

WHEN delivering evidence before the Royal Commission, to inquire into the working of the Factory and Workshops Acts, sitting in Manchester, I expressed myself as follows. I am, and have been, a certifying surgeon at Bolton for fourteen years. My observations as to the population of Bolton did not begin with my appointment as certifying surgeon. Having resided all my life in Bolton, I have for forty years taken a deep interest in everything relating to the educational and physical well being of its population. I was brought into immediate relation with the working of the Factory Act fourteen years ago, on being appointed certifying surgeon. The result of my observations in that capacity is the conviction that there is a steady degeneracy going on in the factory population. It has been going on much longer than the fourteen years of my official observation. The observations I have made furnish the following results. At first, for several years, I passed all children that were proved to be thirteen years of age from half time to full time. Struck, however, by the large number of children who, in my judgment, were physically unfit to work full time, I spoke to Mr. Jones, the then inspector of the Bolton district. He informed me that I had power under the law to reject all children not possessing the usual appearance of physique of thirteen; and since then I have persistently refused to pass all children who, in my judgment, were physically unfit to work full time. A record has been kept of the physical condition of the children so rejected, as ascertained by weight. At the same time a similar record was kept of all children at thirteen, or within a month of that age, who were passed unchallenged. The result of these observations shows that there is a steadily increasing degeneracy going on, and that it increases year by year. When I was informed that children were to be over thirteen years of age and to present the appearance of that age, I judged of them by the weight of the body, and the physical development of the legs and arms. At first, the weight test was used to ascertain the difference of power and physical development produced by different diets. In the latter part of last year I was informed that it was my duty to pass all children, unless incapacitated by disease, when positive evidence was furnished that they were thirteen years of age, instead of, as hitherto, judging of them by their development. When passing them, however, I noted exactly their weight and their physical development generally. On examining the children again at the end of three months, or, in many cases, after six months, I have found that many had not increased in weight one ounce; some, indeed, had lost weight, thus confirming my opinion that the child was physically unfit to work full time, and that its powers were being overtaxed. The effect of putting a child to work to which it is unequal, or physically unfit, is to stunt its growth, impair its strength, and probably to shorten its life. Even when children are not unfitted by actual disease they are often unfit by lack of physical development, and though they cannot be legally rejected, morally such children ought not to be passed.

In order to show that there is degeneracy going on in the factory population, I produced statistics from an exact account kept for 1869, 1870, 1871, 1872, and 1873, and taking the average of these years, one half of the children who came before me were physically unfit to be passed. The numbers, however, have increased from year to year; but not having taken out the proportions of each year, nor of males as compared to females, more exact statements could not be made.

As regards the means of remedying this state of matters it seemed to me that the age-test of fitness was utterly fallacious, and ought not to be adopted. The real test should be the physical fitness. It is not my belief that the factory labour itself operates prejudicially. The mills are more healthy now than they were years ago. They are cleaner and more free from dust. The only objection raised by the work-people is that the mills are of too high a temperature. I have no personal knowledge of this, but if it is so it will act prejudicially upon the health of the mill hands, especially feeble children. The first cause of the physical degeneracy of the factory population is unquestionably their intemperate habits. By free indulgence in stimulants, and in many cases also by excessive smoking, the constitutions of the parents are debilitated, and their children are born with feeble constitutions as a consequence. The next great cause is the present method of rearing their children, which I regard as exceedingly vicious. Instead of the old method of rearing them after they are weaned, they are brought up on tea and coffee, night and morning, and in too many instances they have tea three times a-day. They get very little milk. Close observation on that head, such as inquiry of the master, of the manager, and of their neighbours, showed that; but when these persons undertook to see that the children got milk twice a day the result was that they grew, from thirteen to sixteen, four times faster than when they got no milk. The exact figures are these. When fed upon tea and coffee, the growth, from thirteen to sixteen, did not exceed four pounds a year, on an average, taking good and bad; but, on a like average, milk-fed children grew fifteen pounds a year. In addition to these causes of degeneracy is that of indulgence in tobacco. Of the population betwixt twelve and twenty, according to the most minute observation and inquiry, no less than one half smoke or chew tobacco, or both. There is no doubt whatever in my mind but that this operates most prejudicially upon the development of a growing child.

The chairman (Sir James Fergusson) then inquired what measures I would advocate for the amelioration of the present state of matters: and my answer was as follows: 'My conviction is that if the standard be kept at thirteen, and that the child shall also present the ordinary appearance and possess the strength of children of that age, the parents would be compelled, in their own interests, to bring up their children differently.' The standard might be kept at thirteen, though in textile fabric-factories it has been raised to fourteen. Physical fitness should be added to the educational test. My colleagues, Drs. Settle and Garstang, entertain precisely the same views. This difficulty adds greatly to the labours as well as to the responsibilities of the certifying surgeons. The question of education is a very important one, and I think that it is very important that a child should undergo an edu.

cational examination ere being permitted to enter upon factory labour; especially since the age is going to be placed at ten years instead of eight. They should also be again examined at thirteen, when passing from half to full time. An improvement followed the carrying out of the law as to education, and where carried out the children were healthier than they were where the law was not carried out.' In answer to an inquiry as to registers, I stated that in addition to the ordinary strength and appearance of thirteen it is necessary that the register or baptismal certificate be produced. Not uncommonly the parents present the register of an older child, who is lying quietly in the churchyard, for a younger one. Occasionally they present registers of which nothing can be made; only last week I had one presented without any name.

In answer to a question from Lord Cavendish as to the age when short time might be commenced, whether it would be bettter to make it ten instead of eight, I replied that certainly ten would be better than even nine; and that my observations were in entire accordance with Quetelet's observations as to the population of Brussels. The textile manufacturers feel it a hardship that they cannot employ children till they are fourteen instead of thirteen; as there is nothing in such manufactures to require a higher age. In reply to a question as to the length of time I had observed the factory population, I stated that for forty years I had made observations. During eighteen years I was alderman of the borough of Bolton; and for a good part of that time I was chairman of the sanitary committee, and that the question of health often came before me. The physical condition of the working classes, especially children, is worse than it was before the labour was restricted. I do not believe that the deterioration results from their having more leisure.

ON MENTAL OVERWORK.

BY SAMUEL WILKS, M.D.,

Physician to Guy's Hospital.

THE instances which occasionally come before the public of official men breaking down under hard work, and the more distressing cases of self-destruction said to have had their origin in overstrain of the nervous system, when considered in connection with such a lecture as that of Mr. Greg, entitled 'Life at High Pressure,' have a scaring influence on people. This must be daily evident to the medical man, as he hears the plaintive tones of his patients and their friends in lamentation over the possible evils which may accrue from their unceasing toil. The lecture alluded to, although by many misinterpreted, was intended, I apprehend, to show the probable injuries inflicted on individuals and on society by the hurry in the competitive race which is always being run in the various trades and professions. It favoured the opinion that the individual, and therefore society, might find better room for culture in some of the quieter walks of life, rather than the notion that the development of man was commensurate with increased travelling speed or quicker telegraphic communication. The purport of the lecture from such a point of view must be commended; but I know that by many it was listened to as implying that the brain and nervous system now-a-days are too much wrought upon by hard work, and that people's nerves are constantly breaking down under its weight. This is a view which a large number of persons, or at least those who come before the medical man, are quite ready to seize upon. It was a pity that the exact moral intended to be drawn in that lecture was not more distinctly stated, when its truth might have been more strictly tested. The subject is one of the first importance, and is probably discussed daily in the consulting room of every physician in London.

It might be thought that medical men who see only the ailing minority can be no better judges than others of the working powers of the community at large. But, on the other hand, it must be remembered that the doctor is a kind of confessor; his breast becomes the repository of the secrets of those who would in no other way divulge them. Every medical man must be aware how very large a number of patients declare that they suffer from overwork, no matter in what sphere of life they may be placed. If the husband is too modest to declare the fact himself, his wife who accompanies him passionately speaks for him. If the lady comes for advice, her daughters declare how family matters so entirely engross her attention, that their mother's energies are overwrought; that if she would only consider herself as much as other people all would be well. If the daughter is the patient, the mother requests the doctor to insist upon the curtailment of some of her arduous duties—such as the cottage-visiting or Sunday-school teaching. The daughter sits a model of self-abnegation, and softly denies the impeachment. This is the daily burden of the song of a host of people; and it being no doubt the experience of other medical men as well as myself, it might be as well to ask what it all means? What amount of sympathy they receive generally at the hands of the profession, and to what extent the prescription 'you must not work so hard' is given, are of course impossible to know.

The question as to what amount of work can be performed by each patient must come daily before the medical man, and he is forced to answer it. The question is generally put by those who have already made the assumption that they are overworked, and therefore are willing to receive but one answer. Apart, however, from prescribing in accordance with the wishes of our patients, the subject is important, and one fruitful of discussion. The amount of work which each man or woman is capable of performing is dependent on their temperament and especial powers, and can only be gauged by their individual capacities. There are some young men whose brains are so weak that they cannot bear the pressure which is put upon them by a little sustained thought. Every year I see one or two medical students obliged to leave their chosen profession and devote themselves to an out-of-door active life. They are quite unable to apply themselves to studies which require any concentration of mind, and at last they throw them up. I have seen the same in those who have intended to follow the law, and more than one banker's clerk who could not bear the drudgery of the ledger. Whilst writing these lines I have heard a young man, a Government clerk, speak of overwork, although his office hours are only from nine o'clock until three. To discover the amount of brain work proportionate to each individual lad is a difficult task; but the cases I have mentioned show that there are persons who cannot sustain any mental tension. At the same

time there are those in business, and the more the pity, who would have adorned any of the professions. I have known more than one mind made in a rare scientific mould entirely wasted. Apart, however, from these individual cases, which must be judged on their own merits, I am anxious to know whether medical men generally accept what seems to be a very popular opinion of the day, and which has been thought to be expressed in Mr. Greg's lecture, that society at large is really suffering from an amount of work, physical and mental, which is injurious to the individual, and therefore to the human race. That an opinion of this kind largely prevails I gather from conversation, and from the public prints; but lately I saw quotations from the sermon of a well-known preacher, in which he declared that our asylums were filled with mad people owing to the overwrought state of the nervous system in the present hard-working age. Now, if the question be put thus broadly, Are people suffering from overwork? I, for one, should have no hesitation in saying, No; but, on the contrary, if both sexes be taken, I should say the opposite is nearer the truth, and that more persons are suffering from idleness than from excessive work. Medically speaking, I see half a dozen persons suffering from want of occupation to one who is crippled by his labours. I have, therefore, very little sympathy with the prevalent notion that nervous and other diseases are due to overwork; and, as regards the statement of the preacher above mentioned, I apprehend he never thought of testing the truth of it by a visit to the public asylums, for he might then have been impressed with the sight of the numbers of the lower classes and the altogether unlettered persons confined therein.

As regards the community generally, or at least those of its number who come before the medical man on account of their ailments, my belief is that the explanation they offer arises from a delusion; and amongst girls, so far from any studies or other work being injurious, I could instance numerous cases of restoration to health on the discovery of an occupation. Very often when a business man complains of being overdone, it may be found that his meals are very irregular and hurried, that he takes no exercise, is rather partial to brandy and soda, and thinks it not improper to half poison himself with nicotine every night and morning. The lady in the same way eats no breakfast, takes a glass of sherry at eleven o'clock, and drinks tea all the afternoon; when night arrives she has become ready to engage in any performance to which she may have been invited. When the man of business presents himself with his nerves really overstrained, he is found to be a man of delicate or actual insane temperament. The rule, however, is, that when a patient comes before me with his nerves unstrung, hypochondriacal, and goes through the whole machinery of his body to inform me of its working, previously committing all the facts to paper lest an important one should be forgotten, that that man is getting rusty from having no occupation. Amongst many medical men for whom I prescribe, my three worst and most chronic cases are, first, that of a gentleman who has sufficient means to prevent his caring for practice; second, that of another who has taken a partner, and who has been an idle man for two years; and a third, that of a gentleman who a few years ago had a large fortune left him, and who has now become so fearful a hypochondriac, and has his nervous system so shattered, that it might be thought he was the victim of some terrible railway accident. So marked a case of a comparatively young man running to seed, and having the animal machinery rust from disuse, I have rarely seen. It is generally admitted that, amongst men, a want of occupation is so detrimental that no demonstration of the fact is required. They are the bread-winners; and the pursuit after the necessities of life for one's self and belongings is believed to be intimately associated with health. But if this be a physiological law, it is equally applicable to women; and it may be shown that a very large number of ailments in girls is due to want of occupation or idleness. This also could be proved by numerous examples; such as the case of a girl who had kept her bed for years, suffering from every possible hysterical vagary, until her sister got married and the charge of the household devolved upon her, when a most speedy recovery took place. Some clever girls, who are naturally joyous, hopeful, and gay when young, soon reach an age when they become sentimental, and all the bright visions they had pictured slowly fade away; they fall into a listless dreamy state, which acts most injuriously on their physical organisation; their artificial and morbid condition is too often fostered by medication and unnatural diet; the seeds of consumption or other ailments are being sown; and the interesting invalid slowly fades away. All this might frequently have been prevented by an occupation or some active exercise of the faculties.

We forget sometimes what a formidable machine is the animal body, with its force-producing nervous system. The brain is an engine of many horse-power; its energy must be accounted for in some way; if not used for good purposes, it will be for bad, and 'mischief will be found for idle hands to do.' It is fortunate that with many girls the frivolities of life keep them idly busy, and so, having a safety-valve, they are harmless to others and themselves; but let a girl occupy herself neither with what is useful nor with amusement—she falls into bad health, she becomes a prey to her own internal fires or forces, and every function of the body is deranged, as well as her moral nature perverted. Cases of this kind appear to me of the commonest order, and at the same time very difficult of cure, because the mother's aid can rarely be gained to assist the doctor, but, on the other hand, her sympathies too often only foster her daughter's morbid proclivities by insisting on her delicacy and the necessity of various artificial methods for her restoration, as well as her resistance to the doctor's advice for a more natural life, since she is sure it cannot be undertaken. Her daughter is too delicate for any of the occupations or modes of exercise proposed; what she requires is medical attendance, and to be alcoholised and physicked. It is remarkable, however, what a young lady can do under the power of a stimulus; as, for example, a gentleman lately expressed his surprise to me how his daughter, who could not walk many yards for a long time owing to a pain in her back, was soon able to walk many miles a day when she procured the support of a lover's arm. It is from considerations of this kind that, when the superfluity of women, amounting to half a million, doomed to be unmated, ask for employment, I cannot deny it to them. The human body is made for work, physical and mental; the amount it can do is of course proportionate to the power of the machine; but, unlike all other machines,

its strength is only maintained by use, as assuredly it rusts and decays by disuse. Just as the muscles are better prepared for work by previous training, so the nervous system, whether it be the brain or spinal cord, becomes more energised by use. If healthy and vigorous persons be taken, there appears no absolute necessity for rest at all in the popular sense of the term. The rest required is gained during sleep, during meals, and necessary healthful exercise. It is only during sleep that the brain is actually inactive, although even then not absolutely; for at meals cheerful conversation keeps the mind employed, and even in our walks the attention is fixed on objects around. In times so occupied there are many persons whose minds are never idle, and who yet live to a good old age. Practically they have no rest, for when one object of study is complete, they commence to pursue another. It is by the happy faculty of diverting the powers into different channels that this is accomplished. Instances might easily be quoted of statesmen, judges, and members of our own profession who know no absolute rest, and who would smile at the suspicion of hard work injuring any man. I make it a custom to ask young men what their second occupation is—what pursuit have they besides their bread-earning employment. Those are the happiest who possess some object of interest, but I am sorry to say there are few who find delight in any branch of science. The purely scientific man finds his best recreation in literature or art, but even in intellectual works so many different faculties are employed that a pleasant diversion is found in simply changing the kind of labour; for example, a judge after sitting all day and giving his closest attention to the details of the cases before him may yet find relief in his evenings by solving problems in mathematics.

The subject of overwork, then, is one of the greatest importance to study, and has to be discussed daily by all of us. My own opinion has already been expressed that the evils attending it on the community at large are vastly over-estimated; and, judging from my own experience, the persons with unstrung nerves who apply to the doctor are, not the prime minister, the bishops, judges, and hard-working professional men, but merchants and stockbrokers retired from business, government clerks who work from ten to four, women whose domestic duties and bad servants are driving them to the grave, young ladies whose visit to the village school or Sunday performance on the organ is undermining their health, and so on. In short, and this is the object of the remarks with which I have troubled your readers, that in my experience I see more ailments arise from want of occupation than from overwork, and, taking the various kinds of nervous and dyspeptic ailments which we are constantly treating, I find at least six due to idleness to one from overwork.

COMPULSORY REGISTRATION OF INFECTIOUS DISEASES.

THERE can be but one opinion about the importance of the objects sought to be attained by the following recommendations. Until there be a legal compulsion to give information of the occurrence of a case of infectious disease in any house, it is idle to expect that such diseases can be 'stamped out,' at the only time when the 'stamping out' process is likely to be effectual, namely, at the beginning of an epidemic. The Manchester and Salford Sanitary Association has therefore done good service in calling the attention of Lord Derby specifically to the need of legislation for this purpose. It is open to question, however, whether that portion of the recommendations which places the onus of giving information, under penalties, upon the private medical attendant would be acceptable to the profession, or work conveniently in practice. It would be a burdensome duty in many cases. For the purposes of justice and the public good it might be enough to require that the medical attendant should give a certificate, at the time of his first attendance or as soon as the disease can be diagnosed, to the person in charge of the patient or to the occupier of the house, to the effect that the case was one of infectious disease; and the person receiving the certificate should be required to forward it to the local authority. This is the method adopted in the case of certificates of vaccination. Unless the private practitioner were paid a fee for his certificate, this is the most, we think, that could fairly be demanded of him.

If the local authority were empowered to give a fee for the certificate, as appears to be contemplated, although not stated in the provisions, then the local authority might reasonably require that the medical certificate should be transmitted to it directly by the medical attendant. We throw out these remarks for consideration, as we think that the provisions might be improved in these particulars. There should be also proper certificate-books, with counterfoil, provided for the use of medical practitioners. This would afford evidence that the necessary certificate had been given in case it should happen to be purposely suppressed. There are some other points of detail that occur to us, but we do not deem it necessary to urge them now, as we should be glad to see the principle of the provisions accepted by the Government. Some regulations of the nature suggested are indispensable to an effective sanitary system, and will be adopted sooner or later.

In the petition which has been forwarded to Lord Derby for presentation to the House of Lords the Manchester and Salford Sanitary Association make various important suggestions with reference to the Public Health Bill now before Parliament. It commences by stating that the association has for many years devoted much attention to the subject of infectious diseases, the precautions which should be taken to prevent them spreading, and the advancement of medical science by their systematic registration; and asks the House of Lords to insert clauses in the bill 'specifying certain fevers and other infectious diseases which shall be within the provisions of the Act, and providing as follows: That all such cases of fever or any other infectious diseases within the Act shall be speedily brought under the notice of the sanitary authority having jurisdiction over the area in which they occur. That in order that this may be done, medical men attending such cases shall be bound to give immediate notice thereof to such local sanitary authority. That they shall also be bound to declare their infectious character to the persons in charge of the houses in which they occur, so that some immediate precautions may be taken to prevent them from spreading. That when no medical man is in attendance, such persons in charge shall themselves give the required notice to the local sanitary authority. That every local sanitary authority

receiving such a notice shall immediately send printed directions as to the disinfection of clothing, etc., and as to precautions which should be taken to prevent the spread of infectious diseases to the person in charge of the house where such infectious disease is. That these directions shall include various methods of disinfection, some of which shall be capable of being adopted by persons in the poorest circumstances; that they shall be drawn up and printed under the supervision of the medical officers of the Local Government Board; and that every local sanitary authority shall be bound to keep a stock of them ready for immediate use. That at intervals of not more than ten days, counting from the receipt of these directions, such person in charge shall send to such local sanitary authority the certificate of a duly qualified medical man that the directions have been properly acted upon. That he shall continue to do this until he send to such authority the certificate of a duly qualified medical man that no person in the house under his charge is ill of fever or any other infectious disease within the Act, and that those parts of it requiring disinfection, together with the bedding and clothing used by and about the person who was sick, have been thoroughly cleansed and disinfected. That medical men wilfully neglecting to give notice and to declare as under the circumstances above mentioned, medical men or other persons giving false certificates, and persons in charge of houses having cases of fever or any other infectious disease within the Act in them wilfully neglecting to give the required notice when no medical man is in attendance, or to act upon the printed directions sent to them, shall be liable to be fined. That the persons last mentioned, on being guilty of any of these defaults, or on failing to send the periodical certificates in question, shall also be liable to have their houses entered by the officers of the local sanitary authority having jurisdiction over the area in which they are situated, who shall have power to do the cleansing and disinfecting required, to remove the infected person to a hospital if necessary, and to charge the cost of such proceedings to the defaulters. That every local sanitary authority shall make monthly returns to the Local Government Board of all cases of fever or other infectious disease within the Act of which they receive notice as above mentioned.'

THE

SANITARY RECORD.

SATURDAY, JULY 24, 1875.

THE CAUSES OF PHYSICAL DEGENERACY.

THE evidence of Dr. Ferguson, of Bolton, as to the growing degeneracy of our factory population, which appears in full in another part of our issue, is matter for grave reflection. In the first place the local press of the district admits that there is nothing sensational or alarmist about the evidence tendered by Dr. Ferguson. It is a simple statement of unquestioned facts. Secondly, the doctor has enjoyed peculiar opportunities for observation, not only as a factory certifying surgeon, but as chairman of the sanitary committee of Bolton. For forty years has he watched that gradual deterioration of the factory population, which is patent to ordinary observers on comparing the mill population with the agricultural labourers around them. For many years he had declined to pass children of thirteen as fit for full-time labour if he found them physically disqualified; but recently he has had no option. The presentation of a register or a certificate of baptism has entitled a child of thirteen to a factory certificate as a matter of right. Consequently the factory laws are being amended in order that their efficiency in checking the employment of unsuitable mill hands may be increased. The Factory Acts, which have regulated the employment of mill hands, were rendered necessary by the deteriorating effects of work upon growing children, and the physical degeneracy which was the outcome of toil unsuited to tender years.

It is now desirable to amend them, and to take still more stringent precautions against the consequences of highly remunerative labour with young children.

As to the causes of degeneracy, the doctor gave first the intemperate habits of the parents, and their consumption of tobacco, by which their constitutions were enfeebled, and consequently their offspring were inherently degenerate. He might have added that intemperance in other respects than alcoholic was not without its effect. Then these children, already of impaired constitution by inheritance, are fed upon tea and coffee when weaned. They are not, however, by any means always suckled; for the married woman often leaves her infant all day in the charge of an old woman or a mere child; and at night gives it Godfrey's cordial to keep it quiet and allay its cravings. For she works in the mill by day, and must rest at night. Then the tea and coffee dietary for children is as bad in its effects as its use is now universal. Dr. Ferguson found that children so fed only grew four pounds per annum, betwixt the ages of thirteen and sixteen; while those who got milk night and morning grew fifteen pounds each year. This needs no commentary. The deteriorated physique of tea-and-coffee-fed children, as seen in their lessened power to resist disease, is notorious amidst the medical men of factory districts. It is not the mere difficulty of procuring milk which prompts this adoption of a tea dietary. The convenience of it is one allurement; while the ideas of feeding their children like those of the better classes around is another. Foolish pride has a good deal to do with it, and to answer for.

As if these different matters were not sufficiently mischievous, the young mill hands indulge, on their own account, in tobacco to a large extent. More than one half betwixt twelve and twenty smoke or chew, or both. The malign effects of indulgence in tobacco by the growing and immature are freely

admitted, even by writers who do not condemn the use of tobacco by the adult and matured. And the evil effects of such indulgence by the young mill hand, with his already feeble physique, are most certain and pronounced. This becomes more important when we remember that these very deteriorated beings are the forthcoming parents of the next generation, and that if matters are bad now they will be worse in the future. For the mill hand usually marries early, and children soon are profitable where labour is well paid and the demand for it ever increasing. But the mother also works in the mill, and the children are left almost untended. If they can be reared at all so as to pass the tests and be enabled to labour, it is sufficient for the parents; who, it further appears, give their minds very willingly to the evasion of the tests employed. They do not look to rearing a stalwart brood, but only to the production of breadwinners, no matter how puny. That a certain mental deterioration should accompany physical degeneracy is only what might be looked for, and the mill hand is as incapable of appreciating for himself the effects of the present system, as he is indifferent on the subject; looking only to his own immediate interest in the matter, and not to futurity.

The important evidence tendered by Dr. Ferguson should move all persons to take a deeper interest in the present condition of our mill population; not only for the immediate effects, but also as furnishing fearful and terribly distinct information as to the causes of physical degeneracy. It is obviously not sufficient to pass Acts of Parliament and to evolve schemes of education; it is absolutely necessary to carefully scrutinise their working, and from time to time to make the amendments required to ensure efficiency. How to approach the serious matters of indulgence in agents which affect the nervous system, as alcohol, tobacco, and no less tea and coffee, is a matter calling for the gravest thought. We can, however, express our deep obligation to Dr. Ferguson for the distinct and unmistakeable testimony given by him; for a knowledge of the evil to be met must precede any attempts at amendment, *i.e.*, that are likely to be efficient. It is not so much the unsanitary conditions by which too many of the mill population are surrounded, nor yet the bad quality of the water, as that of the Calder at Wakefield, which excited Captain Boyton's disgust to have to swim in it, let alone to drink it; it is not these causes of physical degeneracy which we have so much to dread. They are patent and can be combatted. It is rather the reckless selfishness in the form of self-indulgence which we have to fear. The parents indulge themselves, they permit their children to be dragged up rather than reared, so that a large percentage perish; they subject them at the earliest age to drugging by narcotics in order that they may sleep undisturbed; they rear them on tea and coffee which exercises so pernicious an action upon the nervous system when taken to excess; they do their best to smuggle them through the examinations of a thoughtful paternal government; and then the poor creatures themselves complete the deteriorating process by indulgence in alcohol and tobacco when they are little more than children. What can we look for in the next generation of whose proletaires we learn such woful accounts? It is, indeed, time to be up and doing when Dr. Ferguson's testimony receives the corroboration of the most thoughtful of the local press.

ONE OF THE DIFFICULTIES OF A MEDICAL OFFICER OF HEALTH.

THERE are a vast number of rural villages in this country which, from a sanitary point of view, have been likened to so many Augean stables. According to which allusion the medical profession, taking the part of Hercules, has succeeded in bringing the river Alpheus (represented by the law) to wash out these foul situations.

There is, however, this great difference in the two cases; Hercules succeeded in clearing away the accumulated filth of the oxen and goats of Augeas immediately and without the least trouble, whereas the work undertaken by the sanitary authorities of the present day, may in this respect be more aptly contrasted with the second labour of the above-named hero, which he accomplished with immense difficulty.

We might name villages all over the country presenting grossly unsanitary conditions, which would very well illustrate our subject, but we will confine our remarks to a few cases in one of the naturally healthiest, and most picturesque districts in the south of England.

Commencing near the Three Bridges Junction, on the Brighton Railway, and extending eastward through East Grinstead, Groombridge and Tunbridge Wells is a range of hills termed the Forest Ridge. These hills vary from 400 to 600 feet above the level of the sea, and divide the flat land of Surrey from the well wooded valleys of the Weald of Sussex, beyond which, looking like a huge boundary bank, are to be seen the South Downs, the natural bulwarks of this part of England.

Although these downs render a view of the sea unattainable, they do not prevent the sea air from reaching the Forest Ridge, for not only is its unmistakeable taste and smell experienced during a south-west wind, but when this wind brings wet in the form of heavy mist, windows, upon drying, are so sprinkled with sea-salt that they assume the appearance of ground glass. This salt we have repeatedly tasted after scraping it off the windows of a house, nineteen miles from the sea, 'as the crow flies,' but 600 feet above its level.

The natural facilities for drainage of this district are perfect, yet in very many instances they have

been entirely neglected. In fact, if the object of the inhabitants had been to accumulate as much filth as they were able, and to pollute the air to the greatest possible extent, they could scarcely have been more successful. Certainly here is full scope for the activity of the energetic medical officer of health, who has already done much towards advancing the healthiness of his district.

At one small village situated upon the summit and side of a very steep hill, the means of disposal of excrement is notably bad. At one cottage which we visited, and which we were assured was a fair sample of all, there existed a skeleton hut as a privy at the back of the garden, from which the ground sloped downwards towards the house, distant fourteen yards. The excrement was allowed to fall into a hollow in the ground, quite open to the air and view; neither earth nor ashes were mixed with it, so that the smell was very bad. This receptacle had not been cleaned out oftener than twice a year, and about ten persons made use of the closet (if it might be so called). The slops of the house were carried away by an open drain, twenty yards long, into an open hole. In a neighbouring village, rather larger, there is some attempt at drainage, but this is in a very unsatisfactory condition. Our attention was called to a row of eight cottages, in which low fever had existed without intermission for many months. In No. 1, the inhabitants were ill; in No. 2, there was fever; in No. 3, the people were sickly; in No. 4, fever; in No. 5, fever; in No. 6, fever; in No. 7, well; in No. 8, fever. About ten yards to the back of this row were three privies, one of which was used by fifteen different persons, and they were upon ground considerably higher than the cottages. The cesspools, which were cleaned out not oftener than once a year, were closed over outside, but one had the unpleasant habit of overflowing long before its emptying time arrived.

The main drain coming from other cottages was placed under this row, and emitted a great stink from several open gratings; and either from insufficient fall in the drain, or from some other cause, an overflow often took place. One tank through which this drain passed was within five feet of a well which supplied eight families; and we were informed that upon one occasion the drain overflowed freely into this well.

Just below the village is situated a semi-stagnant pond which receives a great portion of the house drainage of the village—*i.e.*, all which the imperfect pipes will carry to it.

Now there are several influential inhabitants in the neighbourhood of this last village who agree in deprecating this unwholesome state of affairs; but, like the rats of La Fontaine, who in solemn conclave unanimously voted that the cat who troubled them ought to have a bell attached to one of her feet, they all propose that the medical officer of health should be written to upon the subject.

The rats failed to find a single one of their number who would volunteer to fasten on the bell, and in like manner none of these good people will undertake the responsibility of writing a letter, the effects of which might make them unpopular in this estimable rural district.

A medical officer of health has many and serious difficulties to contend with, one of the worst of which, in our opinion, is the supineness, or sometimes direct opposition of a large number of the influential landowners in a large country district. If the latter would but co-operate with the medical officer, they would reduce his work to a minimum of what it now is, and in the end work an inestimable pecuniary benefit to themselves. While they now endeavour to avoid the slightest expense or trouble in removing the many nuisances by which they and their tenants are surrounded, they shut their eyes to the fact that sanitary improvement is in every respect conducive to their own good. Improvement of property, improvement of health, pecuniary gain, direct and indirect.

Notes of the Week.

AT the Dublin Assizes, a person named Charles Stenson has been sentenced to five years' penal servitude for causing the death of a child by inoculating it with small-pox.

AN outbreak of scarlatina in a severe form has occurred at Belfast, nine deaths having been registered from that cause last year, and a similar number during the previous week.

THE Sanitary Committee, Birmingham, have recommended that the salary of Dr. Hill, as medical officer of health and public analyst, shall be increased from 650*l.* to 1,000*l.* per annum.

SMALL-POX AT ATHENRY.

THE deaths up to the present have been forty, and we are sorry to state that a few cases have appeared in the surrounding country.

ZYMOTIC DISEASES IN BELFAST.

A HIGH rate of mortality from zymotic diseases has prevailed in Belfast during the past quarter, arising chiefly from the impure water-supply and overcrowding of the poor.

The death-rate from the principal zymotic diseases amounted in consequence to 314, or 23·6 of the total number of deaths registered.

A NEW FEVER HOSPITAL AT WARRINGTON.

THE borough surveyor of Warrington has prepared plans for a new hospital for infectious diseases. The plans have been approved of by the local board. Such a building has long been wanted in the town, as scarlatina is said to be very prevalent there. The difficulty of dealing with epidemics in that town has been one of long standing, and it now remains for the town council to grapple with the evil in an efficient manner.

FEVER CABS IN DUBLIN.

THE Dublin Sanitary Association have directed the attention of the authorities to the inefficient manner in which the fever cabs are kept. Two of these conveyances are provided, but it appeared that one having been required urgently on a recent occasion, it was found that the horse resided at some considerable distance from the cab, so that practically the benefit of one of the fever cabs was lost, as the patient had to be removed in the second cab, after some little delay. The incident is a brilliant example of the way how not to do it.

SCARLATINA AT SEVENOAKS.

WE have instituted inquiries into the alleged epidemic of scarlatina at Sevenoaks, and are in a position to state that the reports have been very much exaggerated. At the beginning of the month a few cases of a very mild character had been reported by the medical officer of health, and every possible means were adopted to prevent the spread of the disease, which had been imported by a visitor.

Notwithstanding the prompt action which had been taken a few additional cases have occurred, but all of a mild type. Only one fatal case has occurred, and that at a mile from the town itself.

HIBERNIAN FILTRATION.

THE town of Bornsoleigh, in the Thurles Union, deserves to be noticed from the peculiar manner in which the filtration of their water-supply is carried on. A resident, writing to the Local Government Board, states that the place is the most filthy spot in Ireland, and that, furthermore, there is no water-supply for the use of the inhabitants except that which has been filtered through water-closets. This kind of filtration certainly differs from other systems in vogue, and certainly has the merit of novelty. In a sanitary point of view, however, we should hope to see it speedily abolished, especially as the Local Government Board have referred the matter to the consideration of the guardians, and we trust that the latter body will take prompt action.

'DEATH FROM NATURAL CAUSES.'

SUCH was the verdict recently returned at an inquest in Whitechapel where a tailor, after a long fast, ate a hearty supper, after which he went to bed, and died forthwith. His only exclamation was, 'Oh, my head!' The medical man stated that the deceased suffered from a weak heart. Under the circumstances of pre-existing disease, and a long fast followed by a hearty meal, the death of the patient becomes intelligible enough; and the view taken that the full meal interfered with the heart's action is a just and sound one. The moral of the tale is, that persons with organic diseases should avoid long fasts followed by repletion; as the enfeebled system is only equal to small amounts of easily digestible food, and a full meal may not only cause much discomfort, but even be fatal,

INFECTED GOODS.

BY the prompt action of the clerk to the Lewisham District Board of Works a serious danger was recently avoided. It seems that an outbreak of scarlet fever had occurred in a house at Sydenham, and that the family had subsequently left the neighbourhood, and their goods were advertised for sale by auction. The clerk, immediately on being informed of the facts, issued printed notices, warning all persons against going in or out of the house, or coming in contact with the goods until they had been disinfected. In this instance the clerk's efforts were successful in preventing what might have led to a serious epidemic. Doubtless, however, very many cases of fatal illness have been caused by the sale and removal of infected goods, and it would be well if the penalties for selling such goods were made more generally known.

FLAVOURING SYRUPS.

AT Bradford, on the 12th ultimo, two persons were each fined 10*s.* and costs for selling 'adulterated cider.' The analyst found it to consist of aërated treacle and water flavoured with fruit essence. The objectionable part of the mixture was stated to be the presence of flavouring matter obtained from fusel oil; but it was not present in sufficient quantity in one bottle to produce any serious consequences. The artificial flavouring compounds derived from fusel oil are practically insoluble in water, and merely serve to impart to it a slight flavour. The quantity required for flavouring each bottle must have been extremely small, and it is difficult to see why its presence was made such an important element in the case. The same argument would apply with equal if not greater force to all liqueurs and confectionery flavoured with compound ethers, and, in fact, against the use of nearly all flavouring matters. In view of this rigid doctrine, essence of bitter almonds, which is highly poisonous if taken in large quantity, should be absolutely prohibited; and yet it is well known that it is extensively used for domestic flavouring purposes. The real gist of the offence, in our opinion, was the selling of an abominable article composed of aërated treacle and water as cider.

LOANS TO SANITARY AUTHORITIES; AN EXTENSION OF TIME FOR REPAYMENT.

THE Local Government Act, 1858, which authorised local boards to procure provisional orders whereby the Lands Clauses Consolidation Act, 1845, could be set in motion, has caused extensive street improvements to be carried out in many provincial towns, and for this purpose loans to a considerable amount have been necessary. To repay these sums in the maximum period of thirty years, when the improvements themselves are good for all time, especially where wide streets have been substituted for narrow and inconvenient ones, was considered a hardship on the present generation of ratepayers. The borough of Derby felt it to be so two or three years ago, hence the council originated a movement for getting the law altered, so that sixty years might be given instead of thirty. Through persevering efforts directed to the late and present Government, the point was ultimately gained last session, by the insertion of a clause in the Sanitary Law Amendment Act, 1874; and, in the case of Derby, effect has just been given to this amendment of the law. The Local Government Board have, after considering the application of the Derby sanitary authority, now granted an extension of time to sixty years, from the original date of borrowing, in respect of a balance of 50,000*l.* for widening streets. This is the first instance in which the new regulation as to an existing debt has been applied.

THE ORIGIN OF DIPHTHERIA.

THE *New York Malical Record* of June 19, in speaking of a late outbreak of diphtheria in New York, remarks:

'It may safely be said that diphtheria does not appear to have any connection with the distribution of the old water-courses of this city; also that a large number of cases have originated without any suspicion of contact with the diseased matter in any form, while in some of these instances sanitary defects of a very serious kind have been found in the dwellings, making it highly probable that noxious emanations and the like have produced the disease. It may possibly be due to the foul emanations from slaughter-houses and other nuisances, or it may arise from some accident or neglect in one's own dwelling, where it was supposed that every sanitary regulation was vigorously enforced. Such might be the explanation of the following interesting case: A prominent physician of this city was suddenly taken ill with diphtheria, and was confined to his room for five days. On recovering, and making a careful

inspection of his premises, he found that in some unknown way the soil-pipe carrying the waste from the adjoining houses had burst, letting in upon his cellar floor a collection of rottenness and filth that was of the most disgusting kind. It is difficult always to be able to make a careful examination of the premises in this way, but it seems probable that if each case of diphtheria were carefully investigated, a large number of the so-called idiopathic cases might be traced to some such source. Many similar instances probably occur to the mind of most practitioners, and there seems to be no reason why such influences as these described should not in many cases be causes of diphtheria, just as they may often produce typhoid fever, puerperal fever, and erysipelas—an opinion that is beginning to be very generally held.

INTOXICATING LIQUORS IN THE EAST OF LONDON.

IN our issue of July 3, we gave a report by Dr. J. Tripe, public analyst for Hackney, of the result of the analyses of thirty-one samples of wine, spirits, ale, and porter, purchased in that district. If Dr. Tripe's conclusions are to be relied on, the beverages sold in the east end are of a very inferior character, and must affect less or more the health of those who drink them. Of the ports it is said that one contained a large quantity of elderberry juice, and that all of them were coloured with foreign colouring matter, and were highly fortified with a coarse spirit, which afforded an offensive and fiery distillate. He also speaks confidently of two of them being mixtures of Spanish red and Oporto wines, and says that the distillates, which were offensive and fiery, had scarcely any vinous smell. One of the sherries he believed to contain no wine at all, but the spirit in the others was scarcely so bad, although much more disagreeable than that obtained from British wines. The brandies were nearly as bad as the wines, the distillates from two of them being fiery, offensive, and without any brandy flavour whatever; to others, grain or potato spirit had been added. With the gins, rums, and whiskies little fault was found. Three out of the five samples of porter were found to be of the ordinary specific gravity, whilst two were so low in this respect as to indicate the presence of added water to the extent of 20 to 33 per cent. respectively. The way in which this result was arrived at is not clear. The specific gravity of porter depends entirely upon the original gravity of the wort, and the degree to which the wort has been fermented, and it is well known that the extent to which fermentation is carried varies in every brewery, and therefore we cannot exactly see how Dr. Tripe can draw any conclusions as to dilution by water from the fact of the density of the beer being low. If by specific gravity is meant original gravity, we are no nearer a satisfactory explanation, for the original gravity of porter from different breweries varies widely, and we are aware of no means by which to distinguish between water added by a brewer and water added by a publican.

It is an undoubted fact that Spanish and Portuguese wines are fortified with spirit before being shipped to this country, and it is asserted, probably with truth, that such wines will not bear the voyage without the addition of spirit; but we think that in most cases more spirit is added than is absolutely necessary. It is difficult, however, to understand how the distillate from a genuine fortified wine had 'scarcely any vinous smell,' for the mere fact of fortifying a wine within ordinary limits is not sufficient to seriously affect the vinous character of the distillate.

With regard to grain or potato spirit being added to brandy, the proof of the presence of either spirit is a question not so much of chemical test as of taste and flavour, and as the spirit of brandy itself, when new, is harsh and fiery, the substitution of the one spirit for the other is a point on which it is necessary to speak with some diffidence.

SANITARY INQUIRY AT DUBLIN.

LOCAL Government Board inquiries into matters connected with public health are quite new in Ireland, and very few have as yet been held. A recent inquiry, held by Captain Robinson, one of the inspectors of the Irish Local Government Board, has attracted considerable attention, inasmuch as it was specially directed to a charge brought by the inhabitants of a Dublin suburb against the Town Commission of the district, under section 49 of the Public Health Act of 1866. The complainants allege that the commission have not provided a sufficient sewer for a portion of the district, that the sewage of this portion of the district is discharged into an open ditch, the effluvium from which is 'dangerous to human life.'

The case for the complainants was conducted by the Rev. R. Maunsell, and the commissioners' case by J. E. Vinnon, Esq., chairman of the board. No legal gentlemen were employed on either side. If the case had been more complicated, the want of legal advice would have been much felt; and we must say the examination of witnesses was conducted in a very loose and irregular manner.

Several witnesses deposed to the great prevalence of zymotic diseases, which appeared to be unusually abundant in such a fashionable, open, and not densely populated district. Dr. Grimshaw had been employed by the complainants to make a report on the sanitary condition of the neighbourhood, according to whose statement it appears that an open ditch runs for about a mile along the Dublin and Kingstown Railway, and receives all the sewage. There is little or no fall in the ditch, so that it was filled with sewage to a depth of from two to three feet, the sewage-mud occupying about eighteen inches of the depth. Dr. Grimshaw declared the nuisance to be very dangerous to the general health of the inhabitants, and mentioned the special diseases likely to be promoted thereby. He declared that the ditch was not a 'sufficient sewer,' and that a proper sewer was necessary to remove the existing danger to public health. The commission did not deny the want of proper sewerage, or that the nuisance was dangerous to health; but pleaded their inability to make anything better without a natural fall. The blame was also cast upon the Railway Company, who do not put any sewage into the ditch, and, lastly, the commission said the Dublin Corporation meant to include the district complained of in the main-drainage works for the city. We believe there is no probability of the Dublin Corporation making this or any other sanitary improvement.

COCK-CROWING.

THERE are many forms of nocturnal noises which are unavoidable, and which must therefore be borne and submitted to. Others, again, are not so necessary. But the most gratuitous of all surely is cock-crowing. It is not merely that cocks are in their nature combative, and crow from pugnacity as well as love, but the time they choose is the most objectionable to their human neighbours they could possibly select.

The character of their vocal effort is especially destructive to sleep and sound repose. It is loud, piercing, and intermittent. Every one knows how some forms of noise, especially if continuous and unintermitting, are actually conducive to slumber, as a waterfall, for instance; but the cock-crow is the enemy of slumber essentially. It is all very well in rural neighbourhoods, for the farmer and his hinds to be awakened by the shrill clarion of the farmyard sultan; but in towns where the hard-worked business or professional man seeks in the early morning hours his soundest rest, the cock-crow is an intolerable nuisance. It is not the crow only, but, as Carlyle complained, it is the waiting to hear the next crow that is felt so strongly. To plead, as was done in a recent case, that the fowl is but a very small one, was very farcical, as a pet bantam is scarcely tolerable even to his partial owner, to say nothing of others.

The noises that cannot be got rid of are objectionable enough to a great population seeking the rest which is more necessary than ever in this striving pushing age, to say nothing of the importance of sleep in critical periods of illness; but to have a whole neighbourhood disturbed, and the rest of scores broken because one person chooses to keep noisy fowls, is the tyranny of a minority with a vengeance. Sound sleep is simply a necessity in this age, and when so many are compelled to resort to narcotics in order to procure the rest they must have if they are to continue their exertions, it seems outrageous that preventable causes of disturbance at night should be tolerated at all.

The abuse of the liberty of the subject reaches its climax in the production of noise, and when that noise is nocturnal it becomes a nuisance which should be as readily dealt with as is a noxious trade. We decline to permit our neighbours to poison our water or to propagate fever to our detriment, and surely there should be some means to prevent noise, especially nocturnal noise, which by disturbing sleep, tends to develop exhaustion and irritability in overworked brains, a condition obtaining extensively at the present. Cabs, market vans, and the workman's hammer may be unavoidable, but cock-crowing and early morning piano-forte practice should be relegated to the country and be kept there.

PROPOSED NEW PARK FOR NORTH-WEST LONDON.

AN excellent movement has been set on foot for promoting the formation of a new park in the north-western suburbs of the metropolis. The site of the proposed park was, it seems, originally intended to be used for building purposes. It forms part of what are known as the Conduit Fields which lie adjacent to railway stations, which have immediate communication with the heart of London—namely the Finchley Road Station (North London and Midland lines) and the Swiss Cottage Station of the Metropolitan and St. John's Wood Railway. The owners of the land are Sir John Maryon Wilson, Lord of the Manor of Hampstead, and his son Mr. Spencer Wilson. These have offered to sell the ground which it is proposed to acquire for the new park for 1,000*l.* an acre. This price is considered to be a reasonable one, having regard to the value of adjacent land; and it has been suggested that an area of from forty to sixty acres should be secured for the park. The quantity purchased will, we presume, depend upon the way in which the public are likely to respond to the appeal for subscriptions—for it is proposed to raise the money by subscriptions. The land will be sold at the price already mentioned, only it would appear on condition that it is made into a park and kept for ever consequently, as an open space. But there seems to be a limit placed by the owners on the quantity to be sold, as they have decided to sell only a portion, and to reserve the remainder of the Conduit Fields for building purposes. This is, of course, good policy, and it will probably be found that the sum ostensibly *given*—that is to say, the difference between the market value of the land and the price at which it is offered for sale—will prove a good investment. We do not wish to say that in this matter Sir John Maryon Wilson and his son are not actuated by public spirit in thus offering land for a public park at less than its real price. But it must be obvious that the value of the remainder of the land immediately contiguous to the site of the proposed park will be greatly enhanced when the park has been formed. Still, it is not the business of the public to look at the matter in this light, and they are bound to be grateful if it is the case, as asserted, that 1,000*l.* an acre is a reasonable price for the land, or if that sum per acre is less than its market value. We are glad to learn that subscriptions in aid of the fund for purchasing the ground have been already forthcoming. At a recent meeting at Hampstead of the promoters of the movement for securing the new park for north-west London several large sums were promised: three of 500*l.* each, some of 250*l.*, and others ranging from that sum downwards. One gentleman, named Cookson, promised that he would give 1000*l.* on condition that a portion of the park should be devoted to cricket, a most reasonable condition, and one which the promoters of the movement will doubtless accept. We trust that the example of this munificent patron of cricket will find many imitators amongst the votaries of the manly sport throughout the metropolis. We trust, too, that the appeal for subscriptions will be liberally responded to by the inhabitants of the metropolis as a whole. In fact we see no reason why the Metropolitan Board of Works should not be asked to grant a sum in aid of the funds for purchasing this land. It is scarcely possible for us to have too many parks in London; and the formation of a new park benefits, not merely the district in which it is placed, but Londoners as a whole. All should, therefore, contribute towards the expense; and to provide a considerable portion of the purchase money from the rates is undoubtedly the fairest method which could be adopted for apportioning the cost amongst the inhabitants of the metropolis.

NEGLIGENCE IN CLERKENWELL.

AN inquest recently held on the body of a child who had died from scarlet fever in Clerkenwell was the means of eliciting a few facts in relation to that parish which, to quote the words of the jury, were 'not of a satisfactory nature.' It appears that a child had died from scarlet fever, and the inquest had been adjourned in order that the body might be removed from the room in which it lay, and in which another child was suffering from the same disease.

An incidental inquiry was also proceeded with in order to see what precautions had been taken to stop the spread of infection throughout the parish.

The Vestry Clerk stated that 'there was a sanitary committee for the parish, who only met now and then just as cases required their attention. Their last meeting might have been two months ago. The medical officer reported cases to the vestry, but not to arouse them.'

The Sanitary Inspector said that there were a few cases of scarlet fever in the parish, and that the deaths of persons dying from fever were reported to him. He did not get the registrar's returns, and knew that scarlet fever was prevalent throughout the metropolis. He only got to know where the fever was by means of the relieving officers. He did not go from house to house to see whether they had fever in the house. He did know that there was fever in the neighbourhood of Noble Street, and that it had been prevalent for some time.

The Vestry Clerk remarked that the inspector had no right to go into a house to see if there was fever without he had just grounds for believing that there was.

The inspector, however, has ample powers to inquire into the sanitary condition of the dwellings in his district; and knowing that fever was prevalent in the district, it became doubly incumbent upon him to do so. Another parallel case occurred in the same parish a few days previously, at Exmouth Street, where a child was found dead in bed by the side of his mother, the child having been suffocated from want of fresh air. The room in which the mother and child slept was 15 feet by 8 feet, and 8 feet high, which allowed 140 cubic feet of air for each person, and a closet close to the window; and they were obliged to sleep with the window open on account of the stench from the drains. This state of things was brought before the notice of the vestry by means of a letter, and an officer called in consequence, and stated that the place would have to be whitewashed and the dust removed, but the removal of the dust was all that was subsequently accomplished. They had till a short time ago been without a water-butt, and before that they had to catch the water they wanted in tubs. There was no water to the closet, which was all in pieces, and the stench from it was very bad indeed. When

they got up they were like dead things, through the closeness of the room. Her eyes were affected through it. There were six of them living in the rooms, for which they paid 6*s*. 6*d*. per week.

Now, a sanitary inspector need have no false delicacy as to the propriety of entering such dwellings as described above, and also in applying the necessary remedies. If the Clerkenwell inspector were to commence a tour of inspection he would doubtless meet with some cases of fever, of which he appears to be in happy ignorance and on which he apparently takes no action.

Clerkenwell is a densely populated parish, no doubt, and a difficult one to deal with in some respects. There can be no excuse, however, for the vestry allowing such a state of affairs to exist as was brought to light at the late inquest, and the censure embodied in the following requisition was well deserved. The memorial, addressed to the chairman of the vestry was, that having returned their verdict, they wished to express their opinion that the sanitary officers of the parish who had been examined on the case did not appear to take such measures as are desirable for checking the spread of scarlet fever now shown to be prevalent in the district, and that the medical officer had not acted in a satisfactory manner. It would be difficult to arrive at any other conclusion.

It is at the same time difficult to believe that the vestry of Clerkenwell have not yet provided a mortuary. It is certainly from no want of information that the vestry have not yet supplied this very urgent need.

SANITARY PANICS.

IT is one of the most encouraging signs of the times that sanitary matters have recently engrossed an increasing share of public attention. It is satisfactory to find towns and communities show a warm interest in their sanitary condition, and a watchful care for their sanitary reputation. As, however, it is possible for an individual to think too much about his health, so does it appear to us to be possible for communities to be over-sensitive in the matter of *canards* as to sanitary condition. Sanitary panics in various forms almost threaten to become a public nuisance. The guardians of Clifton Union have recently decided to change the name of their union because it contains a part of the city of Bristol, and the residents of Clifton parish, a favourite health resort, are convinced that the mortality statistics of the union are in the public mind confused with those of the parish, and that intending visitors to Clifton are deterred by a certain proportion of deaths from fever and other zymotic diseases that occur from time to time in the Bristol city portion of the union. We have recently become aware that false reports have been spread as to the prevalence of fever in more than one large London drapery establishment by seeing advertisements in the most prominent columns of our daily papers, and placard announcements in shop windows, that so and so's establishment is certified by one or other medical man to be free from any zymotic disease, and offering large rewards for the discovery and conviction of the evil-disposed persons who started the false report. Then we read of a recent sanitary scare at Blackpool, a favourite Lancashire watering-place. Somebody is said to have spread a report that fever and small-pox are raging in Blackpool; great is the local indignation at such a report, and great appears to be the fear of its results. The medical officer of health, in consequence of 'rumours at Burnley, Rawtenstall, Birmingham, and other places that small-pox is prevalent at Blackpool,' is called upon to give a formal certificate that 'such is not the case, but, on the contrary, that the town is quite free from that and all preventable diseases.' Still more recently at the west end of London customers are reported to be scared away from the shops in Sloane Street because the *Lancet*, in a notice of the presence of scarlet fever at Knightsbridge Barracks, said that the disease had spread to some of the lodging-houses 'in the neighbourhood of Sloane Street,' where a few of the soldiers were quartered. In consequence of this panic, whether it be a panic among the tradesmen of Sloane Street or of the British public who deal there it is very difficult to say, the medical officer of health of Kensington has been appealed to, to certify that Sloane Street is not a fever nest, and statements have been obtained from 'six medical men—three resident in Sloane Street, and the others in the immediate neighbourhood—saying they had not had a case, nor had they heard of a case of scarlet fever in Sloane Street.' It is hardly necessary here to refer to another and mischievous form of sanitary panic, the morbidly sensitive dread of the neighbourhood of hospitals for infectious diseases. The fatality of epidemic diseases in the more crowded portions of our large towns is in great measure due to the ignorance or indifference of the working classes as to the nature of infectious diseases. The sanitary panic to which the middle classes appear to be subject, in the various forms to which we have referred, arises in great measure from the very superficial knowledge which generally prevails as to the nature and extent of the danger from infection. As to the culpability of malicious reports of the prevalence of fever in sea-side resorts, in drapery establishments, or in certain streets and localities, there can be no question; indeed, it seems scarcely credible that such reports are seriously spread from sinister motives, but we strongly incline to the belief that the real danger to be apprehended from such reports is much exaggerated. We are loth to believe that the number of persons who are so weak as to be deterred from visiting a sea-side resort, or from making purchases at a shop where they are accustomed or they wish to deal, by vague and unsupported reports as to the prevalence of epidemic diseases, is large enough to warrant the publicity which is given to such reports, or the fuss that is made about contradicting them. We shall almost expect next to see medical certificates in the windows of all the Belgravian confectioners to the effect that the creams in their establishments have been analysed and have been found free from all infection. Next to utter ignorance and carelessness about infectious diseases, morbid timidity and dread of them should be most carefully checked. Precautions against fire should be invariably adopted; but those people who live in constant dread of fire are much to be pitied. Those who are liable to be panic-stricken about fever and small-pox should, if possible, be taught that constant dread of suffering from such diseases increases the liability to be attacked, should infection fall in their way. At the same time we repeat our conviction that the effect of such false reports as we have been noticing has been greatly over-estimated by those who fear that they may suffer from them, and that far too much prominence has been given to them.

Medical Officer's Report.

BOLTON.

DR. LIVY reports that the population of Bolton on April 30, 1873, was 89,476, and that at that date the borough was increasing at the rate of 200 per month. The number of inhabited houses, 17,575, gives an average of $5\frac{1}{11}$ persons to each house. The borough covers 2,002 acres, and therefore on April 30, 1873, contained some $45\frac{1}{2}$ persons per acre.

This report is not overburdened with tables or diagrams; but the few it contains convey all necessary information clearly and concisely. A little confusion is caused by the report for 1873 being actually two reports, one for the year 1873, and the other for the year ending October 2, 1873. It is much to be desired that all officers of health should make their reports for the Registrar-General's year, which to a day or two usually coincides with the actual year. Facilities for reference and comparison

are in this way afforded, which facilities do not exist where arbitrary or municipal years are taken. During this year, ending October 2, 1873, infantile mortality was rather high at Bolton. The deaths of infants under 5 years of age comprised 50·1 per cent. of the deaths under 1 year; the births registered were 17·8 against 15·4 in London for the same period. The annual death-rate from all causes was 23·3 per 1,000 per annum; 5·3 per cent. of the births were illegitimate, and to 192 illegitimate births there were registered 91 illegitimate deaths. The zymotic death-rate was 20·8 per cent. of the total mortality. Phthisis, bronchitis, and pneumonia were answerable for 20·8 per cent., the first named disease contributing 8·2 per cent. as its share. In addition to adopting the Registrar-General's year we would suggest to Dr. Livy to add a column to his general table, showing the rates per 1,000 per annum of the deaths in the various classes, and for the total deaths.

As to the general substance of the report, its strong common sense cannot be too highly commended; it is pithy, interesting, and instructive. Dr. Livy claims for 'Hygiene,' that it is 'the latest, as well as the highest development of medicine,' and rightly holds that 'the sanitary improvement of the people is an indispensable preliminary to this social elevation; until persons have attained a certain degree of physical comfort in regard to the dwellings they inhabit and the atmosphere they breathe, it is useless to expect that any of the highest qualities will to any extent take root.'

As to drainage, the people of Bolton are told that 'the majority of their drains are little better than underground cesspools. Privies and cesspools still continue to be erected of the worst construction,' and it is pertinently remarked that 'when a town is honeycombed with cesspools, and the subsoil sodden with slops and filth, it is idle to expect immunity from diarrhœa and other preventable but unprevented diseases.'

Dr. Livy is a strong opponent of water-closets, and advocate of the tub or dry system, and recommends the plan now being extensively adopted at Manchester to the Bolton sanitary authority. Rochdale is complimented as the 'pioneer' in this matter, but it should always be remembered that it was M. Goux, of the Rue Longchamps, Paris, who pioneered Rochdale and set the improved midden system 'agait' in England.

Of the interesting and detailed information collected by Dr. Livy on the midden question we shall make free use in a series of articles now preparing on this subject.

The Health of Watering Places.

VII. HASTINGS AND ST. LEONARDS.

THE Local Board District of Hastings, and the St. Leonards Improvement Commissioners District, are together co-extensive with the Municipal Borough of Hastings, which may be taken fairly to represent the combined watering place of Hastings and St. Leonards. The Municipal Borough of Hastings, standing on 1,636 acres, had a population of 22,910 persons in 1861, which had increased to 29,291 in 1871. This increase was equal to an annual rate of 2·5 per cent., and assuming that this rate of increase has been maintained since 1871, the population of the borough at the middle of this year may be estimated at 32,515 persons.

It may be stated that the medical officer of health, in his annual report for 1874, estimated the population of the municipal borough in the middle of 1874 at 34,000; as, however, he stated the number of inhabited houses to be 4,820, these at 6·7 persons per house, which was the proportion in 1871, would only give a population of 32,274, which was probably nearer the correct number in 1874.

As the boundaries of the borough of Hastings are not co-extensive with the limits of registration sub-districts, it will be necessary, in order to institute a useful comparison of the recent vital statistics of Hastings and St. Leonards as a watering place, to adopt and consider the figures for the entire Union and Registration District of Hastings. The district of Hastings includes, in addition to the borough of Hastings, a rural area of 12,391 acres, on which were enumerated in 1871 a population of 6,351 persons; as this extra-municipal population of the Hastings district and union was but 3,721 in 1861, it is evident that a considerable portion of the natural increase of Hastings occurs outside the borough. These extra-municipal portions of the district of Hastings include the entire parishes of Pett, Guestling, and Fairlight, and portions of Ore, St. Mary-in-the-Castle, and St. Leonard-on-Sea. There is a manifest convenience in dealing with an entire registration district, inasmuch as no correction is necessary for workhouse deaths. The Hastings union workhouse is situated in Ore parish outside the boundaries of the municipal borough; if, therefore, the figures relating to the borough were considered alone, the number of deaths of Hastings paupers occurring in the workhouse at Ore would have to be ascertained and brought into account before correct death-rates could be calculated. The population of Hastings union or district may be estimated at 39,183 for the middle of 1874, and at 40,342 in the middle of this year. The annual rate of increase of the population of the district of Hastings between 1861 and 1871 was equal to 3 per cent., and larger than in the borough.

During the four quarters of 1874 the births registered within the district of Hastings were 1,097 and the deaths 764. The births were equal to a rate of 28·0 per 1,000, whereas during the ten years 1861–70 the average annual birth-rate was 29·5. The registered number of births since 1871 have not increased in Hastings district in the same proportion as they did during the decade 1861–70, and this decline in the birth-rate may certainly be taken as evidence that the present population of the district is not under-estimated, even if it be not somewhat over-estimated. The estimate of 39,183 for the middle of 1874 probably, however, differs but slightly from the correct number.

During the ten years 1861-70 the average annual death-rate in the district of Hastings was equal to 19·7 per 1,000, whereas in each of the two preceding decades, 1841-50 and 1851-60, it had not exceeded 18 per 1,000. In each of the three years 1871-2-3, the death-rate was 18·8, 17·4, and 18·2 respectively; during 1874 the 764 deaths before mentioned were equal to a rate of 19·5 per 1,000, exceeding that which prevailed in either of the three preceding years. It appears, therefore, that in the first four years of the current decade the death-rate in the district has averaged 18·5, and has been 1·2 per 1,000 lower than in the ten years 1861-70, although it still slightly exceeded the average rate in the twenty years 1841-60.

The 764 deaths in Dover district during 1874 included fifteen which were referred to measles, four to scarlatina, twelve to diphtheria, thirty-five to whooping-cough, four to different forms of fever, twenty-two to diarrhœa, and not one to small-pox; in all, ninety-two deaths resulted from these seven principal zymotic diseases, equal to 12 per cent. of the deaths from all causes, and a rate of 2·3 per 1,000 persons estimated to be living. The death-rate from these seven principal zymotic diseases during 1874 in the watering places previously dealt with in these columns, ranged from 1·5 in Ramsgate and St. Lawrence, to 6·4 in Yarmouth; the high zymotic rate in the latter

town was caused by the fatal prevalence of scarlatina during the latter part of the year. Of the thirty-five deaths referred to whooping-cough in Hastings during 1874, a large majority occurred in the first two quarters of the year; eight of the twelve fatal cases of diphtheria occurred in the March quarter, and nine of the fifteen deaths from measles in the three months ending June. Two of the four deaths from scarlatina were returned in the last quarter of the year. The four deaths referred to fever included one each from typhus and enteric fever in the March quarter, and two from enteric fever in the three months ending December. The annual death-rate from fever in 1874 was so low as 0·10 per 1,000 persons estimated to be living in the borough, whereas in the whole of England and Wales during the year this rate from fever averaged 0·56. The annual rate of mortality from diarrhœa in Hastings district during the third or summer quarter of 1874 was equal to 1·2 per 1,000; in the six English watering places previously dealt with this diarrhœa rate ranged from 1·5 in Dover, to 4·9 in Margate. Whether it be the result of climate or of conditions more favourable to infant life, this low death-rate from summer diarrhœa in Hastings may be regarded as a fact worthy of notice.

During the ten years 1861-70 the average annual death-rate from the seven principal zymotic diseases in Hastings district was equal to 3·0 per 1,000 of the mean population during that period. This zymotic rate during the three years 1871-2-3 was 2·0, 1·4, and 1·5 per 1,000 respectively; in 1874 it rose again, as before stated, to 2·3, but the mean zymotic rate during the past four years 1871-4 has not exceeded 1·8 per 1,000, which shows a marked decline from the average rate 3·0 in the preceding ten years 1861-70.

The deaths referred to diseases of the respiratory organs in Hastings district during 1874 were 120, and to phthisis 103; these numbers were equal to a rate of 3·1 per 1,000 from diseases of the respiratory organs, and 2·6 from phthisis. The death-rate from diseases of the respiratory organs last year was equal to 3·6 in Dover and 2·4 in Lowestoft; the phthisis rates were 1·8 and 1·3 per 1,000 in these two watering places. The excessive death-rate from phthisis in Hastings is undoubtedly due to the town being recommended and used as a winter resort for phthisical patients. It is to be regretted that the death-register does not afford the means for distinguishing the deaths of visitors from those of residents, as in cases of deaths from phthisis it would be especially valuable to know how many were of permanent, and how many of only temporary residents. The question of the influence of a considerably large proportion of visitors in the population upon the death-rate of a watering place is an exceedingly complex one. One thing is clear, however, that in a town like Hastings, in which more than 4,000 visitors were enumerated in 1871, it would lead to unsound conclusions if all the deaths of visitors were excluded when dealing with the vital statistics of the town, without also ascertaining and deducting from the population used for the calculation of death-rates, etc., the numbers of the visitors.

The deaths of infants under one year of age in the district of Hastings during 1874 were 165, and equal to 150 per 1,000 of the births registered during the year; this rate was within one per 1,000 of the average rate of infant mortality in England and Wales during 1874. Among the watering places previously noticed this rate of infant mortality in 1874 ranged from 113 and 126 in Ramsgate and Dover, to 154 and 158 in Yarmouth and Lowestoft. Infant mortality in Hastings was highest during the third or summer quarter of the year, and the 165 infant deaths during the year included thirty-six from zymotic diseases, twenty-seven from diseases of the respiratory organs, eleven from premature birth, eight from syphilis, and thirty-nine were returned under the somewhat indefinite headings of want of milk, convulsions, atrophy, and debility. Considering the low death-rate, at all ages, which prevails in Hastings, the rate of mortality among infants was excessively high during 1874, and an investigation into its causes is well worth the attention of the medical officer of health, and of the Hastings and St. Leonards Sanitary Association.

The population of the Hastings District enumerated in 1871 included 2,795 persons aged sixty years and upwards, equal to a proportion of 7·8 per cent. of the population at all ages. Assuming that this proportion of elderly persons in the population has been maintained since 1871, the number of persons living at these ages in the middle of 1874 may be estimated at 3,072, and as the deaths of 192 persons aged upwards of sixty years was registered during the year the rate of mortality was equal to 62·5 per 1,000. This rate was 9.5 per 1,000 below the average rate which prevailed in England and Wales in 1874, while in the other watering-places previously noticed the rate averaged from 56·6 in Lowestoft to 65·1 in Yarmouth.

During the first three months of this year we find from the Registrar-General's Quarterly Return that 227 deaths were registered in the district of Hastings, of which six were referred to the seven principal zymotic diseases; the annual death-rate from all causes during the three months was equal to 22·5 per 1,000, while the zymotic rate was so low as 0·6. The deaths from all causes in the first quarter of this year were one less than those returned in the same period of 1874, when the zymotic rate was 3·2 per 1,000. The effect of the cold weather in the first quarter of this year upon the death-rate in Hastings was more than counterbalanced by the low death-rate from zymotic diseases. It is worthy of note that the sixty-nine deaths of persons aged upwards of sixty years in Hastings, registered in the first three months of this year, only exceeded by three those returned in the same period in 1874.

According to a special return with which we have been favoured by the medical officer of health, it appears that during the three months ending June 30 last the death-rate in the municipal borough from all causes was equal to 19·8 per 1,000, and that eight deaths were referred to the principal zymotic diseases, giving a death-rate of 1·0 per 1,000. These eight deaths included five from diphtheria, two from diarrhœa, and one from typhoid fever.

The health of Hastings during the ten years 1861-70 was less satisfactory than in the previous twenty years; but since 1870 it has again improved. A marked reduction has taken place in the mortality from zymotic diseases during the past few years. It has been shown that the zymotic rate, which was equal to 3·0 per 1,000 in the ten years 1861-70, did not exceed 1·8 in the four years 1871-4, although in the early part of 1874 whooping-cough and diphtheria were somewhat fatally prevalent, raising the proportion of zymotic deaths for the year to 12 per cent. The Hastings and St. Leonards Sanitary Association may fairly claim credit for much useful work in preventing the spread of zymotic disease, and undoubtedly gives valuable aid to the medical officer of health in improving the sanitary condition of the borough, and imparting useful knowledge on health matters to the lower classes. If properly supported, this Sanitary Association would be able to exercise an important influence on the rate of infant mortality in the town, which is doubtlessly rather due to ignorance and negligence than to what is usually understood by sanitary condition.

In conclusion, we cannot too strongly endorse the often-repeated suggestion of the medical officer of health, that the urban sanitary authority of Hastings should possess hospital accommodation under its immediate control for the isolation and treatment of cases of infectious diseases. The resources of the Sanitary Association are probably hampered by its efforts to maintain the Sanatorium, whereas it is clearly in the interest of the sanitary authority, if it be not their duty, especially in watering places, to possess such an institution of their own, under the superintendence of the medical officer of health.

Hastings was selected as a place for invalids before St. Leonards had any existence. Close though they are together, being in fact but one town, yet they are in situa-

tion and in exposure most different. Hastings, like most of our sea-coast towns, was originally built in a valley, and is sheltered by high hills from the north and north-east. St. Leonards may be described as consisting of a magnificent range of houses extending nearly two miles along the shore, backed by cliffs of varying height in close proximity. The houses generally are so close to the sea, that there may be said to be a minimum of land and a maximum of sea air. Though no great difference of temperature or of rainfall has, we believe, been made out, St. Leonards has always been counted comparatively bracing, and Hastings relaxing.

Hastings was in favour as a resort for consumptive patients before Ventnor, or Torquay, or Bournemouth had become known. It is somewhat colder than these places, but has, like the stations in the Isle of Thanet and in Norfolk and Suffolk, a smaller rainfall than more western stations. Its mean winter temperature is about 40°, or much the same as that of London. We do not propose (writing at this season of the year) to say much of the suitability of places for pulmonary invalids—but shall merely remark that Hastings, with its sheltered situation, is counted best suited for nervous erethic cases of phthisis, while St. Leonards is better suited for the more torpid forms.

St. Leonards is a cheerful, pleasant residence. Our visits to it have been short, and we cannot pretend to talk of its social value, but those who know Hastings better than we do can judge how far the character given to it in a guide-book in the beginning of the century is now appropriate. 'Vice has not yet erected her standard here; the numerous tribe of professional gamblers, unhappy profligates, and fashionable swindlers find employment and rapine elsewhere; innocent recreational delights, card assemblies, billiards, riding, walking, reading, fishing, and other modes of pastime banish care from the mind, whilst the salubrity of the atmosphere expels disease from the body. The society of Hastings is gay without profligacy, and enjoys life without mingling in its debaucheries. The assemblies are weekly during the season. Cards and tea-drinking and other innocent amusements fill up the remainder of the time.' One may naturally inquire did the writer describe any real state of things? Was existence at Hastings ever so moral and namby pamby? and were profligates and fashionable swindlers to be found every where else seeking their spoil, except in that favoured spot?

The ordinary amusements of St. Leonards are to this day much the same as those above enumerated. But there are better libraries and news-rooms, cricket and archery-meetings in the public gardens.

Riding is still one of the chief pastimes of St. Leonards, and the varied country behind it offers many inducements to the equestrian and huntsman. There is no great variety of walks, especially of short ones, for invalids. There are the walks along the parades, and the ascent to the ruins of the castle of Hastings, and somewhat further off is Fairlight with its glen. Above, the hill rises to a height of about 500 feet, and affords a very extensive view inland, and on the sea-side one extending from Dover to Beachey Head.

Two of the most interesting distant excursions are to Battle Abbey and to the battle ground of Hastings with all its associations, and to Hurstmonceaux with its church and churchyard; and the interesting and wonderfully perfect ruins of its castle. Those who are curious in antiquarian matters must not forget to proceed by railway and visit Ryde and Winchilsea, with their large churches and ancient monuments. Few places in England are more interesting than those decayed towns. The sea has now receded two miles from Winchilsea. Geologists will here have an opportunity of studying the formation called the Hasting sands, and non-geologists may pick up a little knowledge of that science, and promote their own health by turning collectors of fossils, for interest in almost any occupation is beneficial to us, and fossils cannot be discovered without some personal exertion.

There are several chalybeate springs about St. Leonards and Hastings, and a most praiseworthy effort has been of late years made to promote the use of one of them by a suitable erection. The spring is strongly ferruginous, and to make it more digestible, its water is often ordered to be taken warmed. It is frequently prescribed, and although it is somewhat out of the way, being beyond St. Andrew's pleasure-grounds, still it has a chance of being used most extensively, as a great deal of building is springing up in that neighbourhood.

Hastings has a sufficiently good sea-beach for bathing (sandy with some rocks in it) though neither it nor St. Leonards are very favourite bathing-places. There are bathing-machines and other conveniences. As we hope hereafter to say more of the climate of Hastings as compared with other winter resorts, we shall now return to the consideration of sea-bathing.

We have hitherto only spoken of sea baths as taken in the open sea; but in bad weather, and under various circumstances it may be wise to take cold sea-baths in the house.

Many patients also, under the advice of their physicians, may do wisely in confining themselves to heated sea-water baths; they may commence with remaining in them eight or ten minutes, and increase their stay up to twenty or thirty minutes. According to the temperature and the length of the bath the effect will be tonic or relaxing. For young children, warm baths of from eight to ten minutes are often good; two or three baths a week are sufficient. Fortunately the notion prevalent some fifty years ago that children must be hardened by immersion in cold water, whether the measure was suitable or not, is pretty generally abandoned.

Warm baths are well adapted for old people, although we know ladies over sixty who enjoy their bath in the sea, and have known an old gentleman in his ninetieth year, and having too an intermittent pulse, bathe daily in summer in a running stream; such examples are not to be followed.

It would be very easy indeed, by a little arrangement, to make marine baths stronger and quite equal in strength to the German *sool* baths, of which we hear so much; but we do not know that any proprietors of sea-baths are doing much in this direction.

It need scarcely be said that salt water, cold or hot, may be usefully applied in the form of douches, and is often advantageous in chronic thickening of joints.

Salt water is also occasionally used in injections; but only with advantage as an aperient. Cloths soaked in sea-water are occasionally applied to tumours, to aid in their resolution; and if we are to believe that some of the salt waters, containing a little iodine, when locally applied, dissolve bronchocele, we must not deny the possibility of such local applications of sea-water having some effect. In some districts salt-water is used as a collyrium, but it is not a very satisfactory one. Another sea-side remedy has been revived of late years.

Sea-sand has been from the earliest ages employed as a local application. Augustus thought that bags of heated sea-sand did his sciatica more good than anything else. Natives of Greece and of more southern countries have often buried themselves in the sea-sand heated up by the sun; others, as in Ischia, in sea-sand heated by warm mineral waters. There is no question that rheumatic affections often profit by it. Pruner even says that he has in two months cured, by the aid of the sand of the desert, leprosy that had got the length of ulceration; and the Buccaneers used to cure their fevers in this way. But though sea-sand was used originally, any fine heated sand will answer; and, besides such establishments as they have in Norderney and some other German islands, regular establishments for the application of heated sand have been established in Dresden and some other cities, including London.

From an early period human ingenuity has employed one of the products of the sea for curative purposes. Pliny tells of a man who fell from a tree and broke many of his bones. He was merely kept enveloped in sea-weed, and eventually recovered. The people of Provence apply sea-weed to contusions. Following these hints the great reviver of sea-bathing in Europe, Russell, satisfied himself that 'nature herself supplies us with the best medicine for dissolving tumours in the *Quercus marina* or sea-wrack at one season of the year, for in July this plant bears certain vesicles or pods that contain a slippery and soapy juice. These vesicles are to be squeezed in the hands, and the tumour rubbed with them till it imbibes this soapy liquor; and lastly, it must be washed with sea-water, and dried perfectly clean. This disperses all hardnesses.' This is a curious anticipation of the more recent employment of iodine.

Acting on this principle Foubert has found poultices and such applications of *Fucus vesiculosus* useful in scrofulous sores; and baths have, of late years, been prepared containing more or less of the mucus or slime of sea-weed, and are to be had at both French and English bathing establishments; for instance, at Margate and at Ramsgate, where they are known under the name of ozone baths.

Parliamentary Proceedings.

HOUSE OF LORDS.

DRAINAGE AND IMPROVEMENT OF LANDS (IRELAND) PERMANENT ORDERS CONFIRMATION (FOUR TOWNS, ETC.) BILL.

THE Duke of Richmond moved that standing order No. 174, sec. 4, so far as it relates to the second reading of bills confirming permanent orders, and the order of April 23 last relating to such bills, be considered, in order to their being dispensed with in respect to this bill.

Lord Redesdale trusted that the house would not allow its orders to be treated in this way. If their lordships made orders they ought to be obeyed, and the persons implicated had failed to take the necessary steps at their own risks.

Lord Aberdare doubted whether the rule ought to be formed with so much stringency.

The Duke of Richmond felt the force of the observations of his noble friend (Lord Redesdale), and declined to press the motion, which was then withdrawn.

HOUSE OF COMMONS.

(*Monday, July* 19.)

THE VENTILATION OF THE WAR OFFICE.

MR. HARDY, in answer to Colonel Gilpin, said it was true that there had been a great many complaints with respect to the sanitary arrangements of the War Office, especially that part which was called Buckingham House. The Board of Works had inspected the drainage, and they stated that the building was drained by earthenware pipes of modern construction, and that the drains were thoroughly flushed every week by a main specially provided for the purpose, and were at all times kept in good order. The ventilation of the closets throughout the building was very bad, and it had been determined to remove them outside the building; and it was hoped that in this way a good deal of the evil might be remedied. Four officers had died since 1871; but he was quite unable to say that their deaths were owing to the bad ventilation of the building. It seemed to him that it would be most inadvisable to separate the Commander-in-Chief's department from that of the Secretary of State for War; but everything possible would be done with a view to remedying the evils complained of.

Colonel Gilpin inquired whether two or three cases of fever had not occurred within the last three days.

Mr. Hardy said there was a clerk ill from scarlet fever, but he was not aware that it arose from his being a clerk in the War Department.

THIRD READINGS.

THE following bills were read a third time: Birmingham (Corporation) Water Bill, Bridges (Ireland) Bill, and Artisans' Dwellings (Scotland) Bill.

(*Thursday, July* 21.)

SEWAGE RETURNS.

THE Earl of Rosebery moved for returns with respect to the method, cost, profit, and other particulars respecting the disposing of the sewage in every urban sanitary district in England and Wales.

The motion was agreed to.

LONDON WATER-RATES.

THE Earl of Camperdown asked whether it was intended, on each successive revaluation of the metropolis for parochial purposes, to confer upon the metropolitan water companies additional rating powers without reference to the water-supply; and, if not, how it is proposed to prevent such powers accruing to the water companies under the revaluation, which will come into force in April, 1876.

The Duke of Richmond replied that it was not intended to confer on the water companies any additional rating power without reference to the water-supply. The companies exercised their powers under local Acts, and they were authorised to collect a rate upon the annual value of the premises they supplied with water. But what constituted annual value had not been decided. It was impossible to say, until the valuation lists were out and had been approved, that the effect would be to increase the rateable value.

Lord Aberdare believed the increase in the water-rate consequent upon the increased valuation of houses, while the amount of water consumed remained the same, was a state of things not contemplated when the water companies Acts were passed.

Earl Grey advocated that interests so important as those affecting the supply of water to the metropolis should be taken out of the hands of private companies and transferred to some public authority.

The subject then dropped.

Law Reports.

NUISANCE FROM FOWLS.

AT the Hammersmith Police Court, Mr. Kisch applied for a summons against a neighbour for keeping fowls so as to be a nuisance and injurious to health. A woman was lying ill, and cock-crowing at four o'clock in the morning was not likely to make her better. Mr. Bridge doubted whether it was a case which came within his jurisdiction. Mr. Kisch thought if he could show by medical evidence that the fowls were so kept as to be injurious to health, he would be entitled to an order to have them removed. Mr. Bridge said it would all depend on the manner in which they were kept or whether they had sufficient room. The applicant said that fourteen or fifteen fowls were kept in a small space, and this caused them to crow. He wrote to his neighbour complaining of the noise, and also of pianoforte playing at six o'clock in the morning. He received a reply stating that they were playing Messrs. Moody and Sankey's hymns. Mr. Bridge granted a summons, but gave the applicant to understand that if he failed he would have to pay costs.

BRIEF NOTES OF RECENT DECISIONS.

ARBITRATION.

1875. *Leicester Waterworks Company* v. *Cropstone Overseers.* Disputed Assessment—Reference to Arbitration—Refusal to Abide by Award—Replevin Bond ordered to be given up. (44 L. J., M. C. 92; 32 L. T. 567.)

AUDIT.

1875. *Halifax Union* v. *Wheelwright.* (1) Negligence in Drawing Cheques—Alteration of Amounts—(2) Cheques Payable to Order—Forged Endorsements—Held that the Defendant, the Treasurer and Bank Manager, was not Liable. (44 L. J., Ex. 121; L. R. 10, Ex. 183.)

RATING OF LAND.

1875. *Reg.* v. *Whaddon Churchwardens.* Land Let for Digging Coprolites—Principle of Assessment. (44 L. J., M. C. 73; L. R. 10, Q. B. 230; 32 L. T. 633; [*Odams* v. *W.*] 39 J. P. 404.)

POLLUTION OF WATER.

1875. *Stansfield* v. *Peate.* Pollution of Stream by Mill Refuse—Long-standing Agreement to Purify the Waste-Water before letting it enter the Stream—Decree for Specific Performance made. (*Times*, March 23, 1875.)

LIABILITY OF BUILDERS IN RESPECT OF FLOOD WATER.

AN action has been heard at the Glasgow Small-Debt Court, by which R. Smith, grain merchant, sought to recover from Guthrie and Co., builders, the sum of 12*l.* for damage said to have resulted to pursuer's stock from defenders' servants having dammed up the water-course of the street. The evidence showed that prior to the erection of a building for the school board by the defenders, the drainage water flowed by a channel in front of the pursuer's premises into a hollow that formed part of the site of the school mentioned, but the barricades raised by the defenders checked the current, and on one occasion, after heavy rain, the pursuer's shop was flooded. The Sheriff thought that there might be a question of some nicety between the contractors and the school board, and he had very little doubt that if the pursuer had brought an action against that body he would have been successful, but he had resolved to grant decree against the defenders, because it was quite clear that the natural drainage had been interfered with by them, and they failed to take any means to protect the surrounding proprietors. It was a well known principle in law that the inferior tenant was bound to receive the drainage of the superior one, but he did not say whether there was any liability against the proprietor in the present case, only it was clear that no duty lay on the pursuer, and as the defenders were responsible he gave decree against them with expenses.

Correspondence.

A NEW TRAP.

(*To the Editor of the* SANITARY RECORD.)

SIR,—Will you allow us, the patentees of the patent 'Edinburgh Air-chambered Sewer Trap,' to offer a few remarks upon your article in the SANITARY RECORD of June 19 last, entitled 'A New Trap,' and having special reference to our patent?

In your description of an ordinary old-fashioned trap you seem to us to disregard two important facts. You defend it as being supplied with (1) a ventilating shaft, and (2) a water-valve or trap, which you call 'an hydraulically sealed trap through which 'no sewer-gas can well escape save when there is some most extraordinary pressure of gases in the sewer.' We believe (1) that the constant recurrence of down draught in every ventilating shaft so often prevents its upward action as to make it a sorry protection to a house against sewer-gas, and (2) that no water trap is of any practical use in keeping back gases, which are rapidly absorbed on the sewer side of the trap, and given off on the house side. We hold that the careful and able experiments of Dr. Fergus, of Glasgow, have abundantly proved these two points, and it was his masterly pamphlet which first directed our attention to the utter inadequacy of all existing traps in which there was no severance made between the house-pipes and the drain.

With reference to our own trap, you say 'the patentees claim, amongst other things not so easy to understand, that the air-chamber severs all connection between the house-pipes and the drain, and that it prevents sewer-gas being forced into the house by pressure up the sewer.' Without doubt this is so. This is exactly what we wish to establish. If it be true that (1) as you allow, we do by means of our trap prevent sewer-gas being forced into the house by pressure up the sewer, and (2) as we claim, prevent its gaining an entrance by being sucked in through the house-pipe, then we submit that we have solved a problem which has hitherto puzzled all sanitarians, and introduced a trap which is able to save thousands of valuable lives; and as Dr. Littlejohn says, to cause typhoid fever and diphtheria to be rarely heard of. If you can spare us a few more lines we will take your objections seriatim, and answer them shortly.

1. With regard to the escape of the smell of the fæces into the open air. The fæces are fresh when they pass into the air-chamber, therefore the smell is not injurious, and owing to the rapid fall in the air-chamber it is found that practically no smell arises. If it did, it could only be momentary when the water-closet was used, and if the air-chamber were not there the smell would go back into the house.

2. The clogging of the syphon. A syphon made upon our plan is not so likely to get clogged as one made of the old pattern, because the division plate does not go down nearly so far into the water. Supposing it, however, to be clogged, it is perfectly accessible, and can be cleaned with the greatest ease, without displacing the trap, or opening the ground, while an exit for any foul gas which may be generated is afforded by the grating of the air-chamber.

3. The disinfecting trap. We do not consider this necessary. If it is used (and it already has its place in most public sewers) it can easily be protected from the rain.

4. The fastening of the ventilating shaft. This is considerably underground, and can be made secure in any way that is wished, even by being cemented.

5. The flap. The use of the flap is quite optional. We have never used it ourselves or found it necessary.

In one word we claim (1) that whatever can happen to our apparatus to interfere with its operation must happen in an ordinary drain, in an aggravated form, and (2) that no other trap does afford, as ours does, immunity from sewer gas in houses. We court inquiry and investigation, feeling certain that the successful trials we have made of the trap, and particularly in a house containing 100 persons, proves that it is applicable to all places, and that it does afford complete protection from sewer gas. POTTS AND CO.

Handsworth, Birmingham,

[We insert the above letter with pleasure, because the writers seem to think that our brief notice of their trap was an unfriendly one. But it was meant to be in no way hostile, and the few criticisms which we made were only those which would fairly have occurred to any one who had to examine carefully this class of sanitary goods. We suggested the dispensing with the flap-trap, because we felt certain that it would never work, and our strictures upon syphons generally were only the result of experience. A disinfecting trap, if built as proposed at first, would also become inoperative after the first shower, and it is no easy matter to protect a tray from the wet.

The patentees have somewhat altered the form of the trap for the better, and we ventured to suggest the need of this. Where there is no objection to a momentary exposure of the soil we have no doubt that the trap will work well, and in the matter of ventilation the trap is well equipped. We shall be very glad to learn that it has been fairly tried in London, for we really want a contrivance which shall ventilate both sides of the water-traps. It takes time to arrive at the perfected form of anything, and we hardly know a single sanitary article which is exactly like the original patent. Let therefore Messrs. Potts and Co. be of good heart and persevere.]

STORM-WATER AND SEWAGE,

(*To the Editor of the* SANITARY RECORD.)

SIR,—I am afraid that Dr. Carpenter is not quite satisfied with my remarks upon his Croydon sewage arrangements and storm-waters, although I held up the former as a model for other towns, and intended only to refer generally to the latter subject, without giving offence to any particular place or its authorities.

Dr. Carpenter, by his own showing, must be fully convinced of the policy of excluding storm-water from sewers as far as possible; and if the Wrexham Town Council had expended a twentieth part of the sum (5000*l.*) devoted by Croydon during the last year to diverting storm-water, I should be fully satisfied.

Reference to my letters, published about a year ago, in the *Mark Lane Express* and the *Standard*, will show that, in practice, I recommend such an approximation only to the 'separate system,' as Dr. Carpenter himself adopts; but, in order to arrive at an approximation to what is right, I think it is sometimes desirable to put forward in theory a grand ideal of perfection—to aim high, in fact, in hope of hitting a distant mark; and this must be the excuse under which I submit to Dr. Carpenter's reproof. It is, indeed, important to regard all local circumstances in considering sewerage schemes; and I agree with Dr. Carpenter in liking moderately diluted sewage; but, if he acted personally as farm manager, and were not implicated in existing sewerage works on the combined (or partially combined) system, I am sure he would desire to have the degree of such dilution as constant a quantity as possible.

With regard to Dr. Carpenter's objection to the total exclusion of storm-water, I would observe that silica from the streets is generally an inconvenient ingredient in town sewage, and that I should much prefer albumina in place of it if streets could be paved with clay, although the mechanical effect of silica might be useful upon a stiff clay soil.

General Scott, alluding to this silicious detritus in a recently published pamphlet, says, 'Should the separate system come into use, as it ought, and this detritus be altogether excluded from the pipes which carry off the water-closet sewage, the balance (profit on sludge) would be much better than this.'

And although in certain cases rain-water from the streets may look to the eye 'more impure than our ordinary sewage,' I challenge Dr. Carpenter to prove by analysis that a fair specimen of such street washings contains any considerable proportion of organic pollution. The experiments of Professor Way are, as far as I know, the only data on this point, and, speaking from memory, I may say that the greater proportion of impurities which he detected in the water from London streets after heavy rain consisted of inorganic and comparatively harmless matter; but I think the evidence of Professor Voelcker, given as follows at a public inquiry at Windsor, is quite conclusive, viz., 'I do not think the Thames Conservators would have any objection to the surface water passing into the Thames through a separate sewer from the sewage. The statement that the proportion of the pollution of surface water to sewage is as ten to twelve must be founded on some mistake. I do not believe that water passing down the streets and running from the roofs of houses would naturally contaminate the river.'

In conclusion I may remark that within the last fortnight I have heard from Mr. John Phillips, C.E., who proposed the 'separate system' as long ago as the year 1849, and from Mr. Menzies, who revived it in 1865, acknowledging that their views are at last coming rapidly into vogue, and that the separate system now requires but very little more coaching.

ALFRED S. JONES,
Lieut.-Col.

Hafod-y-wern Farm, Wrexham,
July 16, 1875.

Sanitary Invention.

AËRATED BREAD.

THAT our present system of bread-making is in an unsatisfactory state is a fact which we think few people will be disposed to deny. The unpleasant circumstances which occasionally come to light through the medium of the police courts, as our columns have shown on more than one occasion, leave an unfavourable impression on the public mind. The incidents of the dough being mixed by manual labour in a close underground cell, by perspiring men in a semi state of nudity, are not comfortable to contemplate. From time to time the remains of insect life may be discovered in bread which has been purchased even in first class localities.

These circumstances all point to the necessity which exists for abolishing *in toto* the primitive and objectionable method of making bread by hand labour, whilst there is also the inevitable danger of that 'baker's plague,' ropy bread, being caused by the constant use of the old-fashioned wooden troughs.

Besides these evils there is also another important reason why the present system of manufacturing the 'staff of life' should be changed, and that is the loss of nitrogenous and nutritious qualities through fermentation. It is by no means improbable that 10 per cent. of the flesh-forming constituents of flour may be lost by being converted into carbonic acid.

When we look at an ordinary piece of bread we see that the vesiculation varies from the minutest size to that of more than an inch in diameter. The very large vesicles being caused by a copious evolution of carbonic acid through sundry patches of flour. If this process were carried out long enough, there would be very little food value left in the bread. A worse result than this happens occasionally when lactous and other acids are caused by false fermentation from the use of putrescent or highly impure yeast, the effect of using the ordinary baker's yeast being to give rise to a species of fermentation of which at present very little is known. One thing, however, is very certain, that some of these ferment growths resemble in a marked manner the ferments found in certain diseases of the blood. Whether, however, the one has ever conduced to produce the other is more than can be positively affirmed, but there is at least a probability that the one may be the result of the other.

Various methods of vesiculation have from time to time been attempted to obviate these dangers, such as the mixture of hydrochloric acid and carbonate of soda, and several other effervescing mixtures; but the best of these are liable to contain impurities to a considerable extent, which are not always free from danger, and must inevitably produce a larger proportion of salt than can be considered advisable in an article so largely consumed as bread.

All endeavours to raise bread without importing fermentative matter propose to accomplish the object by the formation of carbonic acid within the dough. This can only be properly attempted by adopting all the necessary precautions.

In the first place, the gas must be produced in a separate generator, then it must be washed and purified, and finally introduced into the dough from a receiver at a perfectly controllable pressure.

It must be obvious to anyone who examines a piece of properly aërated bread that a much greater certainty of thorough vesiculation can be obtained by this method, whilst the necessity for this impregnation being accomplished by machinery has led to the perfection of that system of bread-making by the Aërated Bread Company. If no other result had been accomplished by this company than the introduction of machinery into the manufacture of bread, and the superseding of the old dirty, foul, and laborious system of bread-making, that would have deserved our best appreciation.

The best food value in the flour being secured, no waste or destruction of any of its most important constituents can occur in any of the processes adopted in making aërated bread; and as the wheat is ground, dressed, mixed, aërated, and baked without the possibility of pollution either from dangerous ferments or disgusting manipulation, bread so made can alone be considered as really pure.

As we said before, the present primitive, dirty, and uncertain system of bread-making is a disgrace to our civilisation, and we gladly welcome any method which will ensure a cleanly and wholesome compound and effect a much needed sanitary reform.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

BETTS, Nathaniel Philip, M.R.C.S. Eng., L.S.A. Lond., has been appointed Certifying Factory Surgeon for the District of Ashby de la Zouch, vice Dicken, deceased.

CLARKE, Mr. William Henry, has been re-appointed Inspector of Nuisances for the North Witchford Rural Sanitary District, at the reduced salary of 30*l.* per ann., Chatteris having been severed from it and formed into an Urban Sanitary District.

GREGORY, George, M.D. Univ. St. And., L.R.C.P. Lond., M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Westhoughton Urban Sanitary District: 30*l.* per ann.

PETTINGER, George William, M.R.C.S. Eng., L.S.A. Lond., has been appointed a Certifying Factory Surgeon for Manchester, vice George Pettinger, L.R.C.P. Edin., M.R.C.S. Eng., L.S.A. Lond., resigned.

RUCKLEY, Henry Robinson, L.R.C.P., Edin., L.R.C.S., Irel., has been appointed Certifying Factory Surgeon for the District of High Wycombe, vice Bowstead.

SHONE, William James, M.R.C.S. Eng., L.S.A. Lond., has been appointed Certifying Factory Surgeon for the District of Great Marlow.

WATSON, Mr. Joseph, has been appointed Collector to the Stockton Urban Sanitary Authority, vice Fowler, resigned.

YOUNG, Mr. William, has been appointed Inspector of Nuisances for the Worcester Rural Sanitary District, vice Coxell, appointed to the Lichfield Rural Sanitary District.

VACANCIES.

CARDIFF RURAL SANITARY DISTRICT. Inspector of Nuisances. Application to W. P. Stephenson, Clerk to the Authority.

FAVERSHAM. Certifying Factory Surgeon.

FAVERSHAM RURAL SANITARY DISTRICT. Medical Officer of Health for the No. 2 Sub-District.

GATESHEAD-ON-TYNE. Certifying Factory Surgeon.

LECKHAMPTON URBAN SANITARY DISTRICT. Surveyor, 45*l.* per ann. Inspector of Nuisances: 30*l.* per ann. Applications, 26th inst., to Daniel Mallory, Clerk to the Authority, Cheltenham.

PRESTON. Town Clerk, Registrar of the Borough Court of Pleas, and Clerk to the Urban Sanitary Authority: 850*l.* per. ann., fees amounting to about 140*l.* per ann., office accommodation, stationery, etc. Application, 28th instant, to Robert Ascroft, Town Clerk.

SELBY RURAL SANITARY DISTRICT, Yorkshire. Inspector of Nuisances: 80*l.* per ann. Application, 24th instant, to Charles Newstead, Clerk to the Authority.

WESTON-SUPER-MARE URBAN SANITARY DISTRICT. Surveyor.

WHICKHAM URBAN SANITARY DISTRICT. Medical Officer of Health: 50*l.* per ann. Surveyor and Inspector of Nuisances, 130*l.* per ann. Application to Thomas Lambert, Clerk to the Authority.

SANITARY PATENTS.

2308. Improvements in the method of clearing the streets of a town from mud, snow, filth, sweepings, or other impurity. Edward Hodson Bayley, Newington Causeway, Southwark, Surrey.

2377. Improvements in apparatus for flushing or cleansing urinals, water-closets, sewers, and for other analogous purposes. Frederick John Smith, Taunton, Somersetshire.

ABSTRACTS OF SPECIFICATIONS.

4312. Preserving fermented liquors. W. T. Read, Midland Railway Buildings, Pancras Road.

A solution of neutral sulphite of magnesia is used in the proportion of from one to five parts to every 1,000 parts of the liquor to be preserved, such solution being made by adding magnesia to liquid sulphurous acid until the acid ceases to dissolve the magnesia, the resulting liquid possessing no smell, and imparting less taste to the liquor than the bisulphites hitherto employed.

4431. Purification of water. J. A. Wanklyn, Charlotte Street.

The object of this invention is to extend the application of the Clark process to those other waters to which it is not at present applicable, and this object he attains by the use of carbonate or bicarbonate of soda, or of other soluble carbonates or bicarbonates which will effect the decomposition of the salts of lime and magnesia, and yield carbonates or bicarbonates of lime or magnesia, to which the usual Clark process is then applicable. After having thus treated the water containing soluble salts of lime or of magnesia other than or in conjunction with bicarbonate of lime, the inventor then submits the same to the treatment of what is known as the Clark process. It will then be evident that the softening process which he has described may be employed either as a preliminary process or in conjunction with the lime or Clark's process, in order that the desired results may be simultaneously obtained. The amount of soluble carbonates or bicarbonates to be employed for effecting the softening of the water will, of course, depend upon the amount of the salts of lime and magnesia contained in the water in a form other than that of bicarbonate, and the amount of the carbonates or bicarbonates employed will be in equivalent proportions to those salts or compounds contained in the water to be treated.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer—not necessarily for publication.

A HINT FOR SMOKERS.

IT is stated that cascarilla bark has the power of modifying the effects of tobacco-smoking. The addition of a few very small fragments of the bark will, it is alleged, in most cases counteract the nauseating effects of strong tobacco, although if such a mixture of tobacco and cascarilla bark be smoked to excess, it will sometimes produce loss of appetite, and thirst, with vascular and nervous depression.

OZONE.

ONE of the most striking properties of ozone, says M. A. Boillot, is its bleaching power. The effects ascribed to chlorine are, he says, really due to ozone. Ozone employed directly acts as an oxidising agent, laying hold of the hydrogen of the substance with which it is in contact, whence results bleaching, if the body is coloured. On allowing chlorine to act upon any animal or vegetable matter, it decomposes a certain quantity of water and seizes its hydrogen, forming hydrochloric acid. The oxygen set free by this reaction is transformed into ozone, which, in its turn, lays hold of hydrogen present in organic matter.

Communications have been received from:

Col. Jones, Wrexham; Mr. F. G. Heath, Bridgewater; Dr. Griffith, Sheffield; the Medical Officer of Health, Walton-on-the-Naze; Messrs. Heath and English, Birmingham; Dr. T. K. Chambers, London; Dr. J. B. Russell, Glasgow; Dr. B. W. Taylor, Scarborough; Dr. Henry Vernon, Southport; Dr. Prior, Biggleswade; Mr. John Jowett; Dr. T. W. Grimshaw, Dublin; the Secretary of the Manchester and Salford Sanitary Association; Dr. Taafe, Brighton; Dr. Robinson, Dover; the Medical Officer of Health, for Weston-super-Mare; Dr. R. Cuffe, Woodhall; Mr. Arthur Angell, Southampton; Dr. A. Rabagliati, Bradford; Dr. Thomas Jones, Aberystwith; Dr. James Nicol, Llandudno; Mr. R. Scott Burn, London; Mr. G. S. Elliston, Sanford; Dr. J. Trips, Hackney.

NOTICE.

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Original Paper.

HEALTH AND DISEASE IN FIFTY ENGLISH SEA-SIDE WATERING PLACES.

TILL recently neither intending visitors or the various local authorities troubled themselves much about the sanitary reputation of the watering places which form the favourite resorts of those in search of health or recreation, during the holiday season. All this is now changed, and the eagerness with which any reports unfavourable to the health of watering places are denied or disputed is sufficient evidence that the former carelessness of the holiday public in such matters is a thing of the past. It is well that it should be so, for as health is at any rate the ostensible excuse for this now almost universal annual outing, it is at any rate useful that places which may give strong evidence of unsatisfactory sanitary condition, or in which epidemic disease may happen to be prevalent, should be temporarily avoided. The gradual education of the public to be critical in health matters has also led to real sanitary progress in the condition of our watering places during recent years. Not so very long ago bathing was in several of our watering places almost impossible in consequence of drainage which rendered the sea little better than diluted sewage. In many the water-supply was derived from impure wells. And the sanitary shortcomings in the old portions of many of the small seaside towns or fishing villages which had developed into watering places had become a source of continual danger both to residents and visitors. Already the worst of these defects have in the majority of places disappeared. Improved drainage schemes prevent the sea from being fouled by sewage. Pure and abundant water-supply is now the rule not the exception. Very few of our watering places have neglected to appoint a medical officer of health, and each one has of necessity its sanitary authority which is responsible for its health. Many, although too few, are also provided with suitable accommodation for the isolation and treatment of cases of infectious disease; and in several of the places sanitary associations do useful work, which materially facilitates the duties and increases the usefulness of the medical officers of health.

Until the Registration Act was passed in 1837, no means were available for judging of the degree of salubrity which prevailed in different parts of the country. Now, whatever may be the imperfections of rates of mortality considered as a test of sanitary condition or of the health of a community, they undoubtedly give most useful information in that direction, and even if death-rates, that is, the proportion of deaths to population, be for this purpose unwisely ignored, it is impossible to deny the value of mortality returns, as indicating the prevailing causes of death in different localities.

The public faith in the value of mortality statistics, notwithstanding the remarkably unfavourable criticism to which they have been subjected, continues to increase, and with respect to the health of English watering places the Registrar General's annual table of mortality is now eagerly scanned by all interested in them, either as residents or visitors. The value of the figures in this table have always been to some extent depreciated by the fact that the areas taken to represent the watering places consist of entire registration sub-districts, the result of which is that in many cases the figures relating to a small watering place are merged in those for a considerable rural area and population, probably under a different sanitary authority and medical officer of health. The effect of this disturbing influence upon the value of the Registrar General's figures, as a test of sanitary condition, has, however, in many quarters, been very much over-rated; still it does, to some extent, militate against their acceptance as reliable evidence of comparative salubrity.

It has been our wish to give medical officers of health the opportunity of co-operating with us to place before the public a watering place Table, in which the areas taken should not only correspond as nearly as possible with the correct boundaries of the several watering places, but also with the limits of the sanitary districts, over which the medical officers preside. With this object in view, we recently addressed a circular to the medical officers of health of fifty English sea-side watering places, enclosing a form on which the desired particulars were to be entered. The results of this circular appear in the Table which is printed in this week's issue.

Although the Table is not quite so complete as we could have wished, it is a pleasant duty to express our sincere thanks for the very general courtesy with which our request for co-operation on the part of the medical officers of health of these fifty watering places has been met. In but one or two cases was any objection made to furnish the information asked for; and we may probably attribute the omission to reply to our circular, in a few cases, rather to inadvertence than to any real objection to assist in our somewhat laborious undertaking. Part of our scheme was to afford to officers of health the opportunity to print a few remarks explanatory of the figures relating to their sanitary districts, which opportunity is not open to them when the Registrar General's Watering Place Table is published. These explanatory remarks, so far as they were furnished, will be found incorporated with the notes under the names of the different watering places.

We should wish briefly to describe what we consider the legitimate and what the illegitimate use of such statistics of watering places as those we publish in our Table. The primary object is to inform the public as to the recent state of health of these watering places, and above all to show whether they are or not suffering from the prevalence of epidemic diseases. The publication of such reliable and recent health statistics, furnished by the local medical officers of health is the best answer to such mischievous or foolish *canards* as that which has recently disturbed the equanimity of Blackpool. The object of all the well-wishers of these several watering places should be to show low death-rates, especially from zymotic diseases, and this we are glad to find is very generally shown in our table. It should, however, be remembered that the figures only relate to three months, which is too short a period to give such reliable value to the figures as to warrant any classification of the watering places, according to this quarter's death-rates, which might lead the public to accept these rates as proof of relative salubrity. Any such attempt would be misleading, and we may take this opportunity to say, that the difficulties in the way of estimating the health of a watering place by the mere inspection of its death-rate, are far too great to sanction the attempts which have been made to decide from such figures which is the healthiest among the healthy watering places. The figures we publish easily show whether the state of health in the several places during the three months ending June 30 last was such as to inspire confidence in the public that the projected holiday excursions may be advantageously and safely undertaken. Any real cause for alarm, such as danger from infectious diseases, could scarcely fail to appear in these figures. Before, however, the relative salubrity of our health resorts can be satisfactorily decided, a much more elaborate system of statistics of health and disease for such places as are largely frequented with visitors will have to be invented and impartially carried out, than any which is now possible. In the meantime, let us make the most use of the figures that are available, and over a series of years such statistics will acquire increasing value.

The figures in our Table represent the deaths from all causes, and a few special causes, registered during last quarter in each watering place, with the annual rates of mortality to 1,000 of the estimated population. This estimated population represents in most cases the residential population only, and takes no account of visitors. Some of the southern watering places form, however, a few ex-

ceptions as when the Census was taken in April, 1871, they contained a certain number of visitors. In Hastings, for instance, it is stated that no less than 4,000 of the population there enumerated in 1871 were visitors. As the estimated population of the watering places is based upon the enumerated population in 1861 and 1871, it follows that the death-rate is considerably favoured by the accident of the Census having been taken at the season when a large number of visitors were in the town. In such watering places, however, as Llandudno, Rhyl, Southport, or Scarborough, the enumerated population in 1871 contained scarcely any visitors. It follows, therefore, that any attempt to decide the relative salubrity of such watering places by the death-rate calculated upon the estimated population based upon the enumerated numbers of the population, must be more or less delusive. The number of deaths referred to the principal zymotic diseases, and especially their proportion to the deaths from all causes, afford, however, valuable indications of the sanitary condition of the different watering places, without entering upon the controversial ground of their relative salubrity.

It is proposed at the forthcoming meeting of the Social Science Association at Brighton to discuss the difficulties which beset the calculation of trustworthy death-rates for popular health resorts, in many of which, for several months during the year, the number of visitors considerably exceeds that of residents. For the purposes of our Table we requested that no deductions from the deaths might be made on account of the deaths of visitors, and we have every reason to believe that in furnishing the information for this table, medical officers of health have made their returns in accordance with this principle, although if some satisfactory definition of a visitor could be agreed upon, and the fact could be entered in the death register, we are of opinion that these deaths would be properly excluded from the calculation of the death-rate in those towns the enumerated population of which consisted exclusively of residents.

We would briefly allude to one more disturbing element in the calculation of death-rates for such small areas and populations as those of a large number of our watering places. The situation of the union workhouse within or without the boundaries of the watering places has a not inconsiderable influence upon their calculated death-rates. The proportion of deaths in workhouses to the total deaths in a union generally ranges between 3 and 10 per cent. It is important, therefore, that, if a workhouse be situated within a watering place, the deaths of paupers not admitted from the watering place should be excluded; whereas in cases where the workhouse is situated outside, the deaths of the watering-place paupers should be brought into account when the death-rate is calculated. The same remarks apply, in a modified extent, to deaths in hospitals and lunatic asylums. It is much to be regretted that the facts entered in the death-register do not afford the necessary information for the correct distribution of institution deaths to the localities from which the inmates were admitted. The medical officers of health, in some of the watering places included in our Table, have made the requisite corrections for these deaths in workhouses; but in many they do not appear to have been made, probably through the difficulty in obtaining special returns of the deaths of paupers showing the names of the parishes from which the inmates had been admitted. In three only of the watering places are the boundaries of the towns nearly co-extensive with those of the union,—these are Yarmouth, Dover, and Brighton; in these places the workhouse deaths need no distribution.

We will now proceed to note briefly the principal features in the returns for each of the fifty watering places, taking the opportunity to incorporate the remarks appended to their returns by the medical officers of health in explanation of their figures.

1. WHITBY.—The death-rate in the improvement district of Whitby during last June quarter was equal to 28·6 per 1,000, against 20·3 in the corresponding quarter of last year. The ninety-two deaths included three in the union workhouse, which may not all have been of paupers admitted from Whitby. During last quarter the zymotic rate was equal to 4·4 per 1,000, and was higher than in any other of the watering places. This was principally due to the fatal prevalence of whooping-cough. It is satisfactory to find that the outbreak of scarlet fever which caused twelve deaths in Whitby in the first quarter of the year had disappeared in the quarter now under notice. The death-rate in the town during the ten years 1861-70 was excessive, and the liability to outbreaks of zymotic disease is a warning that its sanitary condition is not everything that could be desired. We are not told that it possesses any hospital accommodation for the isolation and treatment of cases of infectious disease.

2. SCARBOROUGH.—The marked improvement in the health of Scarborough which has taken place in recent years appears to be fully maintained. Excluding one death in the union workhouse of a pauper admitted from Filey, which resulted from typhoid fever soon after admission, 104 deaths were registered within the borough during the quarter ending June 30. These deaths were equal to an annual rate of 15·3 per 1,000; in the corresponding quarter of last year the death-rate was 15·5. Six deaths during last quarter were referred to the principal zymotic diseases, of which three resulted from whooping-cough, two from diarrhœa, and one from diphtheria. The annual zymotic rate was thus only 0·9 per 1,000, against 1·3 in the same period of 1874. During the first quarter of this year the deaths registered in the registration sub-district of Scarborough exceeded the corrected average by thirty-eight, and included twenty which were referred to the principal zymotic diseases, of which eight were fatal cases of fever. It is satisfactory to find from the figures supplied for our Table by Dr. Taylor, the medical officer of health, that the health of Scarborough showed such a marked improvement in the three months ending June. Dr. Taylor records the fact that three of the 104 deaths were of visitors, and states that in calculating the death-rate for Scarborough in his periodical reports, he has always deducted the deaths of visitors. This, he urges, is only reasonable, as the number of visitors is not included in the population upon which the rate is calculated. The enumerated population of Scarborough in 1871, taken as it was in April, included scarcely any visitors. As the deaths of visitors are not distinguished in the death-register, we do not think it desirable that this correction should be made; it is, however, well to notice that in the present instance Dr. Taylor's correction for deaths of visitors would only reduce the Scarborough death-rate during the June quarter from 15·3 to 14·9 per 1,000. As the Census in 1871 was taken at a time of the year when northern watering places were empty, whereas many on the south coast were comparatively full of visitors, the death-rates calculated on populations based upon these enumerated numbers are for the purposes of comparison unfavourable to the northern towns. For instance, the enumerated population of Hasting in 1871 was said to include 4,000 visitors, whereas scarcely any were enumerated in Llandudno, Rhyl, Scarborough, and other places on the north and east coasts. This subject is worth further consideration if the salubrity of the several watering places is to be judged by their death-rates.

3. HORNSEA.—The local board district of Hornsea may be estimated to contain a population of 2,049 persons in the middle of this year. The medical officer of health to the local board, in reply to our circular asking for information relating to the recent mortality statistics of Hornsea, expresses his regret that owing to the difficulty he experiences in obtaining copies of the death-register he is unable to furnish for our table the information we asked for. In the registration sub-district of Hornsea, which includes besides the local board district a small proportion of rural population, the deaths registered in the first quarter of this year somewhat exceeded the average for the three preceding

corresponding quarters, but not one was referred to any of the principal zymotic diseases. For the reason above-mentioned we have no information as to the numbers, or causes, of the deaths that have been registered in Hornsea since March 31 last.

4. SALTFLEET.—This ancient seaside village of Lincolnshire, a portion of which was submerged in the German Ocean a century or two ago, is situated in the parish of Saltfleet cum Skidbrook, and its present population is estimated at 417 persons. Dr. Domenichetti, the medical officer of health, informs us that three deaths were registered in this parish during the quarter ending June last; these were equal to an annual rate of 27·3 per 1,000. Of these three deaths one was referred to senile decay, one to acute rheumatism, and the third was a case of infantile jaundice. It is needless to say that in so small a population, the death-rate in a single quarter cannot be accepted as a reliable indication of salubrity. The medical officer of health states that the beach is covered with fine sand, and that the sea at low water recedes to a distance of two miles from the village, which renders it somewhat ineligible as a seaside resort. The climate, however, is said to be salubrious and the air bracing. The characteristics of the place are very similar to those of Mablethorpe on the same coast, where, however, the sea beach is superior.

5. CROMER.—This favourite Norfolk watering place has no defined boundaries. It will be necessary, therefore, in considering its vital statistics, to accept the figures for the parish of Cromer to represent the watering place. No reply, moreover, having been received to the circular which was addressed to the medical officer of health, we have been unable to insert in our Table any figures relating to the mortality during the second quarter of this year. We shall be obliged therefore to fall back upon the information to be derived from the most recently published Registrar General's quarterly return, for the first quarter of this year. The estimated present population of the Cromer parish is 1,447 persons, but the registration sub-district of Cromer consists of a far larger area, which had a population of 7,167 persons at the last Census. When we, therefore, find that the forty-nine deaths in Cromer sub-district during the first three months of this year exceeded the average number by fifteen, and included two fatal cases of scarlet fever, three of whooping-cough, and one of diarrhœa, we remain in uncertainty as to whether this fatality from zymotic disease occurred in Cromer or in the rural portion of the sub-district. It is locally reported that zymotic disease continued prevalent in Cromer during the three months ending June, but on this point we have no authentic information, which we much regret.

6. YARMOUTH.—The municipal borough of Yarmouth contains an estimated present population of 45,210 persons. The health of this town possesses especial interest from the fact that it has recently suffered from a severe epidemic of scarlet fever. The figures which are inserted in our Table, furnished by the medical officer of health, contain conclusive evidence that this epidemic of scarlet fever has disappeared. The 202 deaths registered in the borough during the three months ending June last were equal to a death-rate of 16·9 per 1,000, whereas in the first quarter of the year the death-rate was 23·9. The 202 deaths included twelve which were referred to diarrhœa, four to fever, two to whooping-cough, and one to diarrhœa; thus nineteen resulted from the principal zymotic diseases, and gave a zymotic rate of 1·7 per 1,000. The fatal cases of diarrhœa were, for the season, unusually numerous. The liability of Yarmouth to suffer from epidemics, which has been proved in recent years, is probably due to the sanitary condition of the old parts of the town, which are admittedly over-crowded. It may be hoped that if advantage be taken of the provisions of the new Artisans' and Labourers' Dwellings Bill to improve or rebuild the old parts of the town, Yarmouth will be able to take its place among the healthiest of the English watering places. The sanitary authority of the borough, moreover, will be well advised, in the meantime, to provide hospital accommodation for the treatment and isolation of cases of infectious disease. In No. 50 of the SANITARY RECORD will be found a careful examination of the recent health statistics of Yarmouth.

7. LOWESTOFT.—The improvement district of Lowestoft may be now estimated to contain a population of 17,748 persons, among whom sixty-eight deaths were registered, giving a death-rate of 15·4 per 1,000, against 13·8 in the corresponding quarter of last year. Five deaths resulted from the principal zymotic diseases, of which three resulted from typhoid fever, and two from whooping-cough; the annual zymotic rate in the quarter was 1·1 per 1,000, against 1·7 in the same period of last year. We are indebted for these figures to Dr. Jeffery, the medical officer of health; they are eminently satisfactory as testifying to the continued health of the town. The one unsatisfactory feature of the return, to which we would wish to draw the attention of the sanitary authority, is the continued excess of deaths from fever, to which we drew attention in our article on 'Lowestoft' in No. 53 of the SANITARY RECORD.

8. WALTON-ON-THE-NAZE.—Within the improvement district of Walton-on-the-Naze the estimated population in the middle of this year is 1,284, and, as only two deaths were recorded during the second quarter of the year, the annual death-rate was so low as 6·3 per 1,000, and neither of the deaths was referred to zymotic disease; the zymotic rate was *nil*. The quarterly deaths in so small a population as that of Walton are too few for the calculation of reliable death-rate; after all allowance for this fact, however, the figures supplied to us by the medical officer of health, Dr. Gramshaw, afford favourable evidence of the sanitary condition of Walton-on-the-Naze. So successful, indeed, has the medical officer of health been in raising the standard of health in the place that the improvement commissioners at a recent meeting actually proposed to reduce his annual salary from 40*l*. to 10*l*. Passing over the personal slight to their medical officer of health and the shabbiness of such a proposition, it will not be out of place to warn the sanitary authority of Walton-on-the-Naze that they are acting unwisely in proposing thus to treat a medical officer of health who has done good service, and further to remind them that an efficient sanitary organisation is as necessary to preserve a town's health as to improve it.

9. SOUTHEND.—Southend is a watering place of rapid growth, the population of the local board having increased from 1,646 to 2,808 between 1861 and 1871; the population may now be estimated at 3,524. The return with which we have been favoured by the medical officer of health (Dr. E. E. Phillips) shows that only fifteen deaths were registered during the second quarter of this year, the annual death-rate being 17·1 per 1,000; not one death was referred to any of the principal zymotic diseases. It is well known that sanitary matters have received much earnest attention from the local board in Southend for many years, and the natural result has been a marked decline in the death-rate. The medical officer of health calls attention to the large proportion of ozone in the air at Southend, which constantly amounts to No. 9 of Dr. Moffatt's test-papers. Southend now has the advantage of a good system of sewerage, and the local board district is remarkably free from fevers of a typhoid type.

10. HERNE BAY.—The improvement district which may be taken to represent this watering place has a population estimated to the middle of this year at 1,973. Ten deaths were registered in the three months ending June 30 last, which were equal to an annual rate of 20·3 per 1,000. These ten deaths, however, included four which resulted from an unfortunate boat accident, and excluding these the death-rate would be reduced to 12·2 per 1,000. A most satisfactory feature of this return, for which we are indebted to the medical officer of health, Dr. M. K. Robinson, is that no death was referred to any of the principal zymotic diseases. The death-rate in Herne Bay, and the mortality from epidemic diseases showed a considerable decline from

that which prevailed in the corresponding quarter of last year.

11. MARGATE.—The disease and health statistics of Margate were recently (in No. 51 of the SANITARY RECORD), discussed in these columns at considerable length, it will, therefore, only be necessary here briefly to refer to the figures relating to the three months ending June last, which have been furnished to us by the medical officer of health, Mr. W. K. Treves. The population of the municipal borough of Margate, which in the middle of this year may be estimated at 13,634 persons, among which eighty-four deaths were registered last quarter, the death-rate being equal to 24·7 per 1,000. Three deaths were referred to fever, and one each to scarlet fever and diphtheria, the zymotic rate being equal to 1·5 per 1,000. Both the rate from all causes, and the death-rate from the principal zymotic diseases were lower than those which prevailed in the corresponding quarter of last year. The three fatal cases of fever should engage, as they probably have done, the attention of the sanitary authority of the borough. The hospital for zymotic diseases in Margate, although not in the position which would now be selected, should afford most useful assistance to the medical officer in securing isolation and treatment of patients suffering from this class of diseases.

12. BROADSTAIRS.—This favourite little watering place has no recognised boundaries; those of the Broadstairs ecclesiastical district have therefore been adopted as most nearly agreeing with the boundaries of the watering place. The estimated population of this district, in the middle of this year, was 2,221, and as only three deaths were returned during the quarter now under notice, the annual death-rate was so low as 5·4 per 1,000. No death during the quarter was referred to the principal zymotic diseases.

13. RAMSGATE.—During the three months ending June 30 last, seventy-four deaths were registered within the local board district of Ramsgate, which is estimated to contain a population of 16,008 persons in the middle of this year; the annual death-rate in the quarter, calculated upon this population, was equal to 18·5 per 1·000. The medical officer of health, Dr. Barry, states that he ascertained by personal investigation that nine of the deaths during the quarter were of visitors; if these deaths of visitors were deducted from those registered in the quarter the death-rate from all causes would be reduced from 18·5 to 16·3 per 1,000. The present return is most noticeable from the fact that only one death in the quarter was referred to the principal zymotic diseases; this was a case of infantile diarrhœa. The zymotic rate was therefore so low as 0·3 per 1,000. It is worthy of notice that the deaths from zymotic diseases in Ramsgate during the first quarter of this year were somewhat excessive, and it therefore is all the more valuable that the public should widely know that the health of Ramsgate was so much more satisfactory during the three months now under notice.

14. DEAL.—We are indebted to Dr. Mason, the medical officer of health to the borough, for the recent statistics of mortality in Deal which we have been able to insert in our Table. The present population of the borough may be estimated at 8,221, and the forty deaths registered during the quarter were equal to an annual rate of 19·5 per 1,000; in the corresponding quarter of last year the death-rate of Deal and Walmer was only 17·0. Of the forty deaths, only two were referred to the principal zymotic dieeases, including a fatal case each of scarlatina and diphtheria. The zymotic rate in the borough last quarter was equal to 1·0 per 1,000, against 0·9 in the same period of last year. Further details respecting the recent mortality statistics of Deal and Walmer will be found in No. 54 of the SANITARY RECORD.

15. WALMER.—The local board district of Walmer, which is co-extensive with the parish of that name, has at the present time an estimated population of 4,072. As no reply to the circular addressed by us to the medical officer of health of Walmer has reached our hands, we are unable to insert in our Table any figures bearing upon the recent health of this portion of the watering place, which may as correctly be styled Deal and Walmer as is a watering place on the south coast described as Hastings and St. Leonards. That Deal and Walmer should be under two distinct forms of local government, that each should have a separate sanitary authority and its own medical officer of health is only one of the incongruities of our patchwork system of legislation. So far as health matters are concerned there should be little difficulty in forming these two distinct urban sanitary authorities and the Eastry rural sanitary authority into one combined sanitary district. Such a combination could not fail to prove advantageous to the health or sanitary condition of Deal and Walmer and its neighbourhood. As we have said, we have no information relating to the health of Walmer in the three months ending June; in the first quarter of the year the health of the parish was satisfactory, and no death was referred to any zymotic disease. During the year 1874 the zymotic rate, as we recently pointed out, was 1·3 per 1,000 in Deal, 2·3 in Walmer, and so high as 6·2 in the few rural parishes situated within the Deal registration sub-district.

16. DOVER.—Having recently discussed at some length the vital statistics of Dover (in the SANITARY RECORD, No. 55) it will only be necessary here briefly to notice the import of the figures which have been supplied to us for our Table through the courtesy of Dr. M. K. Robinson, the medical officer of health. During the three months ending June last 113 deaths were registered within the borough, including the whole of the deaths in the Union Workhouse, some few of which may have been of paupers admitted from the rural portion of the union. The annual death-rate was so low as 15·1 per 1,000 of the estimated population. The deaths in the quarter included four which were respectively referred to measles, whooping-cough, fever, and diarrhœa; the zymotic rate was so low as 0·5 per 1,000, against 1·7 in the corresponding quarter of last year, and 0·2 in the first three months of this year. Dover is well provided with hospital accommodation for infectious diseases, and the town council, which constitutes the sanitary authority of the borough, has recently shown zeal in carrying out the recommendations of their medical officer of health, which augurs well for the future health of this watering place. Its sanitary condition, so far as may be judged from a careful examination of its mortality statistics, has been exceptionally satisfactory since the beginning of this year. The large proportion of workhouse deaths in the union of Dover appears, however, to call for investigation.

17. FOLKESTONE.—The health of Folkestone has recently attracted considerable attention, and this attention at one time assumed a sensational form which is to be regretted. It is, therefore, all the more desirable that the widest publicity should be given to reliable figures which can assist in correctly estimating the health of this town and watering place. On this account it was with great regret that we received from the medical officer of health of Folkestone a letter declining to co-operate with us by supplying the information we asked for relating to this town for insertion in our Table; the ground of his refusal was that correct figures for the borough would not correspond with the figures for the sub-district which would appear in the Registrar General's Watering Place Table when published. The ground of Mr. Bateman's objection, therefore, was our principal object in undertaking the compilation of such a Table, namely, that the figures given in the Registrar General's table for entire registration sub-districts do not correctly represent the statistics of watering places. We can understand the reason why Mr. Bateman prefers to have the health of Folkestone estimated from the Registrar General's figures rather than from the correct figures for the borough. The registration sub-district of Folkestone includes Shorncliffe Camp and the parish of Cheriton (within which is situated the greater part of the pretty little watering place, Sandgate), in addition to the borough of

Folkestone. The inclusion of the soldiers in the camp with the population of the sub-district ought to, and undoubtedly does, favourably affect the figures given for Folkestone in the Registrar General's table. The rate of mortality among soldiers is naturally far below that of the general population, as they consist for the most part of young adults, among whom the normal rate of mortality is low. During the first quarter of this year the ninety-nine deaths in Folkestone sub-district exceeded the average of twenty-two, and included seven fatal cases of measles, and one each of fever and diarrhœa. It is locally reported that the fatality of measles was far more severe in Folkestone during the quarter ending June 30 last, although we are unfortunately not in a position to give figures showing the extent of this fatality. As we purpose shortly to consider in detail the full bearing of recent mortality statistics in Folkestone we need not dwell longer upon them here, except to urge upon the town council, as the sanitary authority of the borough, to deal earnestly with the sanitary defects of those parts of the town which, if not exactly meriting the opprobrious term 'fever-nests,' are undoubtedly in a condition which render them at any time liable to injure the sanitary reputation of the town by increasing the death-rate, both from all causes and zymotic diseases.

18. HYTHE.—The ancient municipal borough of Hythe contains a population estimated to the middle of this year at 3,733. The sixteen deaths which the medical officer of health, Dr. Robinson, informs us occurred there in the second quarter of this year, were equal to an annual rate of 17·2 per 1,000, and did not include one from any of the principal zymotic diseases. In the first quarter of this year the deaths in the registration sub-district of Hythe, which contains a considerable rural population as well as the borough, only exceeded by one the average number in the three preceding corresponding quarters, including one each from fever and diphtheria.

19. HASTINGS AND ST. LEONARDS.—In our last issue we discussed at some length the evidence of sanitary condition to be derived from a careful investigation of the recent vital statistics of Hastings and St. Leonards. We may therefore now confine ourselves briefly to notice the figures in our table relating to the second quarter of the year, which have been contributed by the medical officer of health, Mr. Ashenden. In the borough of Hastings 161 deaths were registered in the three months ending June, the death-rate being equal to 19·8 per 1,000; thirty-eight deaths of visitors are included in the 161, and the deaths in the union workhouse (which is situated outside the borough) of borough paupers have been brought into account. Although the estimated population of the borough includes a considerable proportion of visitors, in consequence of the last Census having been taken when 4,000 visitors were in Hastings, there is little doubt but that the death-rate of the borough is considerably raised by the deaths of consumptive and other invalids who resort to the town, especially in the early spring, when the English climate is at its worst. The insertion in the death-register of the residence of all deceased persons, as well as the mere place of death, would, especially in watering places, materially facilitate the compilation of trustworthy mortality statistics. The health of Hastings has considerably improved in recent years, and the decline of deaths from zymotic diseases has been considerable. The town council, however, has not yet provided itself with hospital accommodation for infectious diseases, but is content to use the sanatorium which was established, and is maintained by the local sanitary association, whose efforts in the interest of the health of the town have been as useful as they are praiseworthy.

20. EASTBOURNE.—We have in type an article upon the health of Eastbourne, as estimated from its recent mortality statistics, and therefore shall now only briefly allude to the most recent available statistics of the town. In the first quarter of this year sixty-eight deaths were registered in Eastbourne sub-district, which exceeded the average number by nine, and included seven fatal cases of whooping-cough, four of fever, and one of scarlet fever. This increase of deaths from zymotic diseases, and more especially the four deaths referred to fever, made us especially desirous to include in our Table more recent figures relating to the town. Dr. Fussell, the medical officer of health to the local board, in reply to our circular, expressed however his inability to comply with our request without an authorisation from the sanitary authority of the town, and this sanitary authority only meets once a month. Local report says that the deaths from whooping-cough and fever were probably as numerous in the second as in the first quarter of the year, but we are unable to insert in our Table the authentic figures on the subject which we should have wished to publish. With reference to the deaths from fever, we have so frequently heard complaints of the nuisance arising from sewer gas in the houses and hotels at Eastbourne, especially recently, that we would urge upon the sanitary authority and their medical officer of health prompt attention to the need for improvement in the ventilation of the sewers, and the more efficient trapping of the house-drains. The sanitary authority at Eastbourne, although they have often discussed the establishment of a hospital for infectious diseases, have yet to provide this essential to a complete sanitary organisation for a watering place or indeed for any urban community.

21. BRIGHTON.—Brighton and Hove together form one large town which contains a population estimated now to consist of more than 110,000 persons. This density of population alone constitutes a great sanitary difficulty for Brighton, as it is well known that the aggregation of large populations into town centres has always led to a large increase in the rate of mortality. This waste of life is now, however, through sanitary progress and an increase of general intelligence in health matters, being brought, year by year, more under control. In Brighton, the exercise of this control, which, to a watering place is of such vital importance, has in recent years been attended with considerable success. This is, in great measure, due to the earnestness with which sanitary reform as to drainage, etc., has been prosecuted under the auspices of the town council. They have somewhat recently appointed a medical officer of health, Dr. R. P. B. Taaffe, who has favoured us with the mortality statistics for the town during the June quarter of this year. These figures show a state of health which must be considered satisfactory for a watering place, and remarkably so for a town of more than 100,000 inhabitants; they relate to the municipal borough, which is estimated to contain a present population of only 99,026 persons, for, unfortunately, when the borough was recently extended, Hove, which is to all intents and purposes, a part of Brighton, was not incorporated with the new borough. This small portion of Brighton therefore remains as before under the control of Improvement Commissioners, and constitutes a distinct urban sanitary authority; it thus forms a standing commentary upon our disjointed system of local government. The annual rate of mortality in the municipal borough of Brighton during last quarter was 18·5, and the rate from the principal zymotic diseases was equal to 1·4 per 1,000; it is worthy of remark that each of these rates was below the average rate in the whole of the English watering places, of which we have received information. Moreover a summary of the facts published by the Registrar General in his weekly returns shows that in eighteen of the largest English towns these rates averaged 23·2 and 3·3 per 1,000. Portsmouth was the only one of these eighteen large towns in which the rate from all causes, and from zymotic disease, was lower last quarter than in Brighton. Dr. Taaffe in his return points out the fact that the deaths in the borough of Brighton last quarter included nearly fifty of visitors, and twelve deaths in the Sussex County Hospital of patients who had been admitted from outside the borough; and it is further stated that the exclusion of these deaths from calculation would reduce the death-rate to 18·2 per 1,000. As, how-

ever, the population of Brighton contains a constantly large though varying proportion of visitors, which helps to make up the number which is used as one of the factors in calculating the death-rate, the deaths of visitors can hardly be so simply ignored. In conclusion we may point to the fact that the fatality from whooping cough showed a marked decline from that which prevailed in the first quarter of the year, and that the seven deaths from fever, although undoubtedly excessive, give a fever-rate which is below the average fever-rate that prevails in the whole of England and Wales. Dr. Taaffe, however, pointed out to the sanitary committee of the Brighton Town Council in his last quarterly report that on personal inspection he found some sanitary defects to exist in nearly all the dwellings in which the occurrence of deaths from zymotic disease had caused him to make an inspection. Brighton, in common with nearly all towns having a tidal outfall, suffers to some extent from the want of more efficient ventilation of its sewers, which should be done by shafts, and not by the barbarous system of open gullies in the streets.

22. WORTHING.—Owing to the temporary absence from home of Dr. Kelly, the medical officer of health for Worthing, our Table does not contain any recent figures relating to this watering place, which is under the sanitary control of a local board and contains an estimated present population of 8,225 persons. In the first quarter of this year the deaths registered in the registration sub-district of Worthing included two fatal cases of fever, one of which was said to be of a visitor who was suffering from typhus on his arrival in the town. So far as we have been able to ascertain, no further deaths from fever have been recorded in Worthing since the end of March, but on this point we have no authentic information. We can, however, scarcely expect that the death-rate can have been so low in the quarter ending June last, as it was in the same period of last year, when it did not exceed 12·9 per 1,000.

23. LITTLEHAMPTON.—This watering place, as well as Worthing, forms part of the combined urban and rural sanitary district of West Sussex, to which Dr. Charles Kelly is medical officer of health. Through Dr. Kelly's temporary absence from home we have not received, in answer to our circular, any figures bearing upon the recent health of this watering place. During the June quarter of 1874 the annual death-rate from all causes was so low as 11·9 per 1,000 in the sub-district, taken by the Registrar General to represent this watering place, and the zymotic rate was equal to 1·8. In the first three months of this year the forty-two deaths recorded in this sub-district exceeded by ten the average number in the corresponding period of the three preceding years, including two which were referred to diphtheria, one to diarrhœa, and five in the workhouse. For the reason above mentioned, we have no more recent information as to the death-rate in Littlehampton, although the deaths, probably, again fell below the average.

24. BOGNOR.—The Local Board District of Bognor contains a present population estimated at rather less than 3,000 persons. The return with which we have been favoured by the medical officer of health shows a clean bill of health so far as any deaths from zymotic diseases are concerned. The sixteen deaths from all causes during last quarter were equal to an annual rate of 16·3 per 1,000 of the estimated population. In the corresponding quarter of last year three deaths from fever were recorded in the registration sub-district of South Bersted, which contains this watering place; these gave a zymotic rate of 3·0 per 1,000. The present return, therefore, in this respect, shows a considerable improvement.

25. COWES.—We are informed that the appointment of a medical officer of health to the towns of West and East Cowes has not yet been made, although the matter has been under discussion. The evidence of recent mortality returns is not favourable to the sanitary condition of this watering place, and the sooner the services of an efficient medical officer of health are called into requisition the better will it be for the sanitary reputation and the best interests of the place. During the first quarter of this year sixty-seven deaths were registered in the registration sub-district of Cowes, which exceeded by no less than twenty-seven the average number in the three preceding corresponding quarters. These sixty-seven deaths included fourteen from the principal zymotic diseases, of which thirteen resulted from whooping-cough, and one from fever; these deaths gave a zymotic rate of 4·9 per 1,000. We have reason to believe that the epidemic of whooping-cough has all but disappeared, although cases of fever are reported to have recently occurred, and there is little doubt but that the causes which led to the exceptional fatality of whooping-cough in the first few months of this year, are in a great measure amenable to sanitary improvements. Under the advice of a medical officer of health, they would probably soon be recommended, and it is to be hoped promptly carried out.

26. RYDE.—The return relating to the recent health of the municipal borough of Ryde, with which we have been favoured by Dr. Wilks, the medical officer of health, is extremely favourable. Estimating the population at 12,231 persons (by assuming that the rate of increase since 1871 has been the same as that which prevailed between 1861 and 1871), the death-rate in the borough during the three months ending June last appears to have been so low as 15·4 per 1,000, and the two fatal cases of fever which were the only deaths referred to the principal zymotic diseases, gave a rate of but 0·7 per 1,000. Dr. Wilks reports that the death-rate in Ryde borough from all causes during 1874 but slightly exceeded 16 per 1,000, and the zymotic rate was 1·5 per 1,000. It should be noted that the Royal Isle of Wight Infirmary is situated within the borough of Ryde, whereas the deaths of Ryde paupers occur in the union workhouse at Newport. In order to calculate a correct death-rate, the deaths of patients in the infirmary who were admitted from other parts of the island ought to be deducted from the borough deaths, to which however ought to be added all the deaths of paupers in the union workhouse, who had been admitted from within the borough. For the purposes of the present return, however, it has been assumed that these two disturbing influences balance each other, and the rate has been calculated upon the deaths registered within the borough, without correction for those in institutions. Dr. Wilks does not state whether the two deaths from fever occurred in the infirmary.

27. SANDOWN.—The local board district of Sandown has a resident population which may be estimated at 2,774 persons, among whom ten deaths were registered during the quarter ending June 30 last; these were equal to an annual rate of but 14·5 per 1,000, and it is further satisfactory to find that not a single death was referred to any of the principal zymotic diseases. Dr. Neal, the medical officer of health, states that this low death-rate is somewhat above the average, as during the decennial period 1865-74, the death-rate in Sandown averaged so low as 13·2 per 1,000: he also adds that one of two deaths from phthisis registered during last quarter was of a visitor. There can be no question about the death-rate in Sandown having been satisfactorily low during the last quarter; but it is probably somewhat understated, as it does not appear that any account has been taken of the deaths of paupers in the Union Workhouse at Newport who may have been admitted from the Sandown local board district. A correction for these would, however, probably but slightly raise the Sandown death-rate.

28. VENTNOR.—Ventor, after Ryde, is the next largest seaside urban sanitary district in the Isle of Wight; its present population may be estimated at 5,766 persons. As we have received no reply to our circular addressed to the medical officer of health of this local board district, we are unable to publish in our table any recent statistics bearing upon its state of health. Ventnor is situated in the registration sub-district of Godshill, which contains the parishes of Bonchurch, St. Lawrence, Niton, Chale, and Godshill, besides Ventnor, so that the statistics

for the sub-district can scarcely be taken to represent those of the watering place. It is satisfactory, however, to find, that during the first quarter of this year the deaths in this sub-district were below the average for the corresponding quarter in the three preceding years, whereas, in all the other sub-districts of the island the deaths showed an excess. Only two deaths, moreover, of the fifty registered in the sub-district, were referred to the principal zymotic diseases. We can only hope that the figures for the second quarter of this year, which we should have been glad to place before our readers, are as satisfactory as are those which relate to the first three months.

29. WEYMOUTH.—The municipal borough of Weymouth may be estimated to contain a population of 14,147 persons in the middle of this year, among whom Dr. Tizard informs us that sixty-eight deaths were registered during the three months ending June last; these were equal to an annual rate of 19·3 per 1,000, without any correction for deaths in institutions. Of the sixty-eight deaths, six were referred to the principal zymotic diseases, including two each from measles and whooping-cough, and one each from diphtheria and typhoid fever. The zymotic rate for the quarter was therefore 1·7 per 1,000, which contrasts favourably with the rate from the same diseases in the same quarter of 1874, when, in consequence of the epidemic prevalence of scarlet fever it was so high as 7·3 per 1,000. In the first quarter of this year the mortality returns for Weymouth were not so favourable as those just noticed, as the deaths showed a considerable excess upon the average number, a result owing principally to the fatality from diseases of the respiratory organs, and to the fact that eleven deaths were referred to whooping-cough.

30. LYME REGIS.—This watering place constitutes an improvement district, of which the population at the present time may be estimated at 2,632 persons. The medical officer of health's return, with which we have been favoured, shows that twelve deaths occurred within this district during the second quarter of this year, of which only one was referred to any of the principal zymotic diseases; this was a fatal case of diarrhœa. The death-rate from all causes in the quarter was equal to 18·3 per 1,000, and the zymotic rate was 1·5. It is the more satisfactory to be able to publish this favourable return because the Registrar General's quarterly return for the first quarter of this year showed that in the registration sub-district of Lyme, of twenty-eight deaths registered three were referred to scarlet fever, and one to fever. The medical officer of health (Mr. D. S. Skinner) states in his return that the recent prevalence of scarlet fever has entirely disappeared.

31. SIDMOUTH. — The local board district which must be taken to represent this watering place has a population which may now be estimated at 3,363 persons. The Registrar General in his Watering Place Table gives the figures relating to the registration sub-district of Ottery St. Mary, which has a population nearly four times as great as that of Sidmouth. The medical officer of health, Dr. T. H. S. Pullin, informs us that thirteen deaths were registered in Sidmouth during the second quarter of this year, and that not one of them was a fatal case of zymotic disease. The annual death-rate from all causes during the quarter did not exceed 15·5 per 1,000. The deaths in the Ottery St. Mary sub-district considerably exceeded the average in the first quarter of this year, although it is quite possible that this excess did not occur in Sidmouth, but in other parts of the sub-districts.

32. EXMOUTH.—This pleasant watering place forms a local board district, and has a population which may be estimated at about 5,787. We are unable to give any information as to the recent vital statistics of this town, as it is practically without a medical officer of health. A medical officer was appointed some time since, but as he receives neither salary nor copies of the death register, and is to be paid by fees, if called upon to act, such an appointment can only be called a mischievous sham. We are informed that since his appointment the medical officer of health of Exmouth has never once been called upon to act, so that local board as the sanitary authority of the district, cannot be said to squander the money of its ratepayers in professional advice upon its sanitary condition. Exmouth must indeed be a model watering place if it can afford to dispense with the services of a medical officer of health, and if its sanitary condition is such that it would not be improved by the superintendence of a real instead of a sham medical officer. Such statistics of the health of Exmouth as can be gleaned imperfectly from the quarterly returns of the Registrar General, on account of Exmouth registration sub-district not being co-extensive with the local board district, give favourable evidence of the health of the town up to March 30 last. Sanitary matters, however, will not take care of themselves, and as prevention is better than cure, we should strongly recommend that Exmouth should not wait to be sick before it calls in its medical officer of health. Epidemic disease, or indeed illness of any kind, is very expensive in a watering place.

33. DAWLISH.—The population of the local board district of Dawlish may be estimated at about 3,673, and from the return furnished to us by the medical officer of health (Mr. L. Armstrong) we are informed that twenty-one deaths were registered therein during last quarter, of which only one, a fatal case of whooping-cough, was referred to any of the principal zymotic diseases. The annual rate of mortality from all causes was equal to 22·9 per 1,000, and the zymotic rate was 1·1. The medical officer of health states that three of the twenty-one deaths were of visitors, and that the rate of mortality exclusive of these would be but 19·7 per 1,000. Dawlish and Teignmouth are both situated in the same sub-district, so that the Registrar General's quarterly return does not afford the means for referring to the death-rate in Dawlish in recent quarters.

34. TEIGNMOUTH.—This local board district may be estimated to contain a population of 7,087 persons, among whom, we are informed by Dr. Lake, the medical officer of health, only twenty-four deaths were registered during the three months ending June last; these give the remarkably low death-rate of 13·6 per 1,000. To the principal zymotic diseases three deaths during the quarter were referred, of which two resulted from enteric fever and one from whooping-cough; the zymotic rate was, therefore, 1·7 per 1,000. With reference to the two deaths from enteric fever, Dr. Lake remarks that one was an imported case, and the other was the only indigenous fatal case that has occurred this year; the cases of attack during the same period of six months have not exceeded five or six at the most.

35. TORQUAY.—This is the largest of the Devonshire watering places, and on this account we the more regret that our circular addressed to its medical officer of health has not elicited either a reply or the information we were desirous to insert in our Table. The present population of the local board district of Torquay may be estimated at 24,362. From the Registrar General's quarterly return for the first three months of this year, it appears that in Torquay sub-district (which contains a rural population of about 5,000 in addition to the watering place) 162 deaths were registered during this period, which exceeded the average number in the corresponding quarter in the three previous years by thirty-one. This excess of deaths was in great measure due to the large number of deaths of elderly persons; seven deaths, however, were referred to the principal zymotic diseases, of which three resulted from fever, two from measles, and one each from diphtheria and diarrhœa. It may safely be assumed that the deaths in Torquay were less numerous in the second than in the first quarter of this year; but, for the reason mentioned above, we are unable to publish figures showing whether the number of deaths from zymotic diseases declined during the three months ending June 30 last.

36. DARTMOUTH.—Among the 5,770 estimated present inhabitants of Dartmouth local board, it appears, from a return furnished by the medical officer of health (Mr. R.

STATISTICS OF HEALTH AND DISEASE IN FIFTY ENGLISH SEA-SIDE WATERING PLACES DURING THE THREE MONTHS ENDING JUNE 30, 1875.

	Watering Place	Limits	Population Estimated to the Middle of 1875	Total Deaths	Annual Rate of Mortality per 1,000 Living		Deaths from												Deaths of Persons		Deaths in Public Institutions	Medical Officers of Health	
					Of Total Deaths	Of Deaths from Eight Zymotic Diseases	Eight Principal Zymotic Diseases	Small-pox	Measles	Scarlet Fever and Scarlatina	Diphtheria	Whooping Cough	Fever—Typhus, Enteric, Gastric, and Simple	Diarrhœa	Cholera and Choleraic Diarrhœa	Diseases of the Respiratory Organs	Phthisis	Violence	Aged under one year	Aged Sixty Years and upwards			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
1	Whitby . . .	Impt. D.	12,904	92	28·6	4·4	14	—	—	—	1	11	2	—	—	17	9	—	18	30	3	John Taylerson, L.R.C.P.	1
2	Scarborough . .	M. B.	27,298	104	15·3	0·9	6	—	—	—	1	3	—	2	—	17	14	6	30	27	—	John W. Taylor, M.D.	2
3	Hornsea . . .	L. Bd.	2,049	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Charles Soloman, L.R.C.P.	3
4	Saltfleet-cum-Skidbrook	Parish	443	3	27·3	0·0	—	—	—	—	—	—	—	—	—	—	—	—	1	1	—	R. Domenichetti, M.D.	4
5	Cromer . . .	Parish	1,447	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	A. E. Fluder, M.R.C.S.	5
6	Yarmouth . . .	M. B.	45,210	202	16·9	1·7	19	—	—	—	1	2	4	12	—	32	23	4	41	60	21	John Bateley, L.R.C.P.	6
7	Lowestoft . . .	Impt. D.	17,748	68	15·4	1·1	5	—	—	—	—	2	3	—	—	28	7	—	17	24	—	Edward Jeffery, M.D.	7
8	Walton-on-the-Naze .	Parish	1,284	2	6·3	0·0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	H. Gramshaw, L.R.C.P.	8
9	Southend . . .	L. Bd.	3,524	15	17·1	0·0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	E. E. Phillips, L.R.C.P.	9
10	Herne Bay . . .	Impt. D.	1,973	10	20·3	0·0	—	—	—	—	—	—	—	—	—	3	1	4	1	2	—	M. K. Robinson, M.D.	10
11	Margate . . .	M. B.	13,634	84	24·7	1·5	5	—	—	1	1	—	3	—	—	15	8	1	13	23	14	W. K. Treves, F.R.C.S.	11
12	Broadstairs . . .	Ecc. D.	2,221	3	5·4	0·0	—	—	—	—	—	—	—	—	—	—	—	—	1	2	—	M. K. Robinson, M.D.	12
13	Ramsgate . . .	L. Bd.	16,008	74	18·5	0·3	1	—	—	—	—	—	—	1	—	15	8	—	17	24	3	J. W. Barry, L.R.C.P.	13
14	Deal	M. B.	8,221	40	19·5	1·0	2	—	—	1	—	—	1	—	—	11	6	1	—	19	—	Thomas E. Mason, M.D.	14
15	Walmer . . .	L. B.	4,072	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	R. S. Davey, M.D.	15
16	Dover . . .	M. B.	29,976	113	15·1	0·5	4	—	1	—	—	1	1	1	—	21	14	7	20	37	16	M. K. Robinson, M.D.	16
17	Folkestone . . .	M. B.	14,407	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	W. Bateman, M.R.C.S.	17
18	Hythe . . .	M. B.	3,733	16	17·2	0·0	—	—	—	—	—	—	—	—	—	3	3	—	6	8	—	M. K. Robinson, M.D.	18

Note.—In Col. 2, Impt. D. signifies Improvement District; M. B., Municipal Borough; L. Bd., Local Board; and Ecc. D., Ecclesiastical District.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
19	Hastings	M. B.	32,559	161	19·8	1·0	8	—	—	—	5	—	1	2	—	21	35	2	24	41	—	C. Ashenden, M.R.C.S.	19
20	Eastbourne	L. Bd.	13,263	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	E. F. Fussell, M.B.	20
21	Brighton	M. B.	99,026	457	18·5	1·4	35	—	1	5	2	16	7	4	—	84	66	14	77	128	83	R. P. B. Taaffe, M.D.	21
22	Worthing	L. Bd.	8,225	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Charles Kelly, M.D.	22
23	Littlehampton	L. Bd.	3,766	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		23
24	Bognor	L. Bd.	2,943	12	16·3	0·0	—	—	—	—	—	—	—	—	—	2	3	—	2	5	—	C. Osborn, L.R.C.P.	24
25	Cowes	L. Bd.	7,896	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	No Medical Officer of Health	25
26	Ryde	M. B.	12,231	47	15·4	0·7	2	—	—	—	—	—	2	—	—	9	8	—	9	20	6	A. G. P. Wilks, M.B.	26
27	Sandown	L. Bd.	2,774	10	14·5	0·0	—	—	—	—	—	—	—	—	—	2	2	—	3	2	—	J. Neal, M.D.	27
28	Ventnor	L. Bd.	5,766	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	E. R. Woodford, M.D.	28
29	Weymouth	M.B.	14,147	68	19·3	1·7	6	—	2	—	1	2	1	—	—	15	7	—	7	28	10	H. Tizard, M.D.	29
30	Lyme Regis	Impt. D.	2,632	12	18·3	1·5	1	—	—	—	—	—	—	1	—	5	1	—	3	5	—	D. S. Skinner, L.R.C.P.	30
31	Sidmouth	L. Bd.	3,363	13	15·5	0·0	—	—	—	—	—	—	—	—	—	—	1	—	2	3	—	T. H. S. Pullin, M.D.	31
32	Exmouth	L. Bd.	5,787	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	H. T. Hartnoll, M.R.C.S.	32
33	Dawlish	L. Bd.	3,673	21	22·9	1·1	1	—	—	—	—	1	—	—	—	4	1	—	4	7	—	L. Armstrong, M.R.C.S.	33
34	Teignmouth	L. Bd.	7,087	24	13·6	1·7	3	—	—	—	—	1	2	—	—	7	3	1	5	8	—	W. C. Lake, M.D.	34
35	Torquay	L. Bd.	24,362	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	S. Rhind, L.R.C.P.	35
36	Dartmouth	L. Bd.	5,770	27	18·8	0·7	1	—	—	—	—	—	—	1	—	5	—	—	5	12	—	R. W. Soper, M.R.C.S.	36
37	Penzance	M.B.	10,871	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Francis Boase, M.R.C.S.	37
38	Ilfracombe	L. Bd.	5,160	25	19·4	1·6	4	—	—	—	—	1	1	—	—	1	4	—	3	9	—	E. J. Slade-King, M.D.	38
39	Weston-super-Mare	L. Bd.	11,761	39	13·3	0·3	1	—	—	—	—	—	1	—	—	5	3	—	7	13	1	C. V. Hitchins, M.R.C.S.	39
40	Tenby	M. B.	4,228	14	13·3	0·9	1	—	—	—	—	—	1	—	—	2	3	—	1	7	—	John Griffith Lock, M.A., L.R.C.P.	40
41	Aberystwith	M. B.	7,514	50	26·7	4·3	8	—	7	—	—	—	—	1	—	6	9	1	9	12	—	Morris Jones, L.R.C.P.	41
42	Barmouth	L.Bd. (?)	1,000	3	12·0	0·0	—	—	—	—	—	—	—	—	—	2	—	—	—	3	—	H. J. Lloyd, L.R.C.P.	42
43	Beaumaris	M. B.	2,291	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	R. E. Owen, M.R.C.S.	43
44	Bangor	L. Bd.	7,772	66	34·1	2·6	5	—	—	—	—	2	2	1	—	6	12	—	12	19	1	T. Humphreys, L.S.A.	44
45	Llandudno	Town	3,791	28	29·6	0·0	—	—	—	—	—	—	—	—	—	4	4	—	6	5	—	James Nicol, M.D.	45
46	Rhyl	Impt. D.	4,660	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	A. E. Lloyd, L.R.C.P.	46
47	Southport	M. B.	24,400	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	H. H. Vernon, M.D.	47
48	Lytham	Tnship.	4,252	20	18·9	0.0	—	—	—	—	—	—	—	—	—	9	2	1	3	5	—	P. Hinckes Bird, F.R.C.S.	48
49	Blackpool	L. Bd.	7,719	34	17·7	2·1	4	1	—	—	1	2	—	—	—	4	3	3	10	4	—		49
50	Fleetwood	L. Bd.	4,708	29	24·7	2·6	3	—	—	2	—	—	1	—	—	—	5	6	4	2	—		50

Note.—In Col. 2, Impt. D. signifies Improvement District; M. B., Municipal Borough; and L. Bd., Local Board.

W. Soper), that twenty-seven deaths were registered in the three months ending June last, being equal to an annual rate of 18·8 per 1,000. These twenty-seven deaths included two of non-residents—a sailor, who died on board a Cape mail steamer, and the captain of a yacht who died almost immediately after he landed at Dartmouth. If these two deaths were excluded from calculation, the death-rate for the quarter would be further reduced. Only one death during the three months was referred to any of the principal zymotic diseases; this was an infantile case of diarrhœa. These figures bear evidence of an improved sanitary condition of the town since last year, when during the corresponding three months the death-rate from all causes was 23·3 per 1,000, and the zymotic rate 1·8.

37. PENZANCE.—This, the only Cornish watering-place in our list, is a municipal borough, the population of which may be estimated at 10,871 persons. As we have received no reply to our circular, addressed to the medical officer of health of this borough, we are unable to publish any figures relating to the second quarter of the year; but must content ourselves with gleaning what information we can respecting the health of Penzance, from the recently published quarterly returns of the Registrar General, although the registration sub-district of Penzance does not satisfactorily represent the borough, as it contains a population nearly doubly as large. In the June quarter of last year the death-rate from all causes in Penzance was equal to 20·7 per 1,000, and the zymotic rate 3·0. In the first three months of this year the 143 deaths registered in the sub-district exceeded the average by seven, and included nine fatal cases of whooping-cough, and four of diarrhœa. The zymotic death-rate in Penzance has recently been excessive for a watering place, and affords evidence that there is sanitary work to be done in this borough. We shall be glad to find that during last quarter the death-rate in Penzance from the principal zymotic diseases declined, but, for the reason above-mentioned, we have no reliable information on the point.

38. ILFRACOMBE.—This favourite North Devon watering place is a local board district, with a present population estimated at 5,160. In the return, with which we have been favoured by Dr. Slade-King, it appears that, after the exclusion of one death of a person in the Cottage Hospital, who had been admitted from Wales, twenty-five deaths were registered within the local board district of Ilfracombe during the three months ending June 30 last, which were equal to a rate of 19·4 per 1,000. Only two deaths were referred to the principal zymotic diseases; these were a fatal case each of whooping-cough and simple fever, and Dr. Slade-King is able to add that these two are the only deaths from zymotic diseases since January 1 last. During the last twelve months we are informed that the sewers of Ilfracombe have not only been provided with a new outfall, but what is almost more important, that these have been successfully and effectually ventilated by a system of shafts fixed along their course. It is to be hoped that if this system be as successful as it is described to be, that it will be tried in other watering places where more efficient ventilation of the sewers is much needed.

39. WESTON-SUPER-MARE.—This Somersetshire watering place, from the return with which we have been favoured by the medical officer of health (Mr. C. V. Hitchins), appears to have been unusually healthy during the three months ending June 30 last. The population of the local board district of Weston-super-Mare may be estimated at 11,761 persons, and as only thirty-nine deaths occurred during the three months the annual death-rate was so low as 13·3 per 1·000. As further evidence of its satisfactory sanitary condition, attention may be called to the fact that only one death in the quarter was referred to any of the principal zymotic diseases, and that the zymotic death-rate was but 0·3 per 1,000. This clean bill of health is the more satisfactory because in the June quarter of last year the death-rate in Weston was 19·8 per 1,000, and from zymotic diseases 3·0; and even in the first three months of this year nine deaths in the Banwell registration sub-district, which contains this watering place, were referred to the principal zymotic diseases, including three fatal cases of fever. It is to be hoped that this marked improvement in the health of Weston-super-Mare will be maintained.

40. TENBY.—The municipal borough of Tenby has at the present time an estimated population of 4,228, and as we are informed by the medical officer of health (Mr. J. G. Lock, M.A., Cantab.) that but fourteen deaths were registered therein during last quarter, it follows that the annual death-rate did not exceed 13·3 per 1,000. The fourteen deaths included one of a visitor, four from old age, and two from heart disease. The only fatal case of a zymotic character was one of fever; the zymotic rate was, therefore, only 0·9 per 1,000. The medical officer of health appears to be justified in saying 'the sanitary state of the town at present is uncommonly good.' So far as may be judged from the figures in the Registrar General's quarterly return for the first quarter of this year relating to the Tenby registration sub-district, it appears this watering place has enjoyed an almost complete immunity from zymotic disease since the beginning of this year.

41. ABERYSTWITH.—The health of this Welsh watering place was not so satisfactory during the three months ending June last as its friends could have wished. The population of the municipal borough of Aberystwith may be estimated at 7,514, among which, fifty deaths were registered last quarter, and were equal to an annual rate of 26·7 per 1,000. These fifty deaths included seven fatal cases of measles, and one from diarrhœa; these eight deaths give an annual zymotic rate of 4·3 per 1,000, which excepting alone the rate from zymotic diseases in Whitby was higher than that which prevailed in any of the watering places for which we are able to publish the information. The medical officer of health (Mr. Morris Jones) informs us that during the past year much useful sanitary work has been done within the borough, including a new system of sewerage; arrangements have also been made by the town council for furnishing an increased amount of water to the borough, and when this scheme has been fully carried out the medical officer of health expresses a hope that the town will be supplied on the constant system.

42. BARMOUTH.—This watering place has recently risen in popular estimation, and has become a favourite resort. The medical officer of health (Mr. H. J. Lloyd) estimates the population at 1,000, and reports that only three deaths occurred therein during the second quarter of this year. Thus the annual death-rate appears to have been so low as 12·0 per 1,000; moreover, not a single death was referred to any one of the principal zymotic diseases. In the Barmouth sub-district, which contains a population more than eight times as large as that of the watering place, only one death from the principal zymotic diseases was recorded during the first three months of this year.

43. BEAUMARIS.—So far as this watering place is concerned, we have not been favoured by any information relating to its recent health statistics from the medical officer of health to whom our circular was addressed. This small municipal borough has a present population not exceeding 2,291; and, as the registration sub-district of Beaumaris had a population of 12,519 in 1871, it is impossible to obtain useful results from the totals of this sub-district. It is sufficient, therefore, here to say that during the first quarter of this year only two deaths in the sub-district were referred to zymotic disease—one each to fever and diarrhœa.

44. BANGOR.—The local board district of Bangor has at the present time an estimated population of 7,772, whereas the registration sub-district has a population of nearly double that amount. It appears from the return with which we have been favoured by the medical officer of health that sixty-six deaths were registered within the local board district during the quarter ending June, of which two each resulted from whooping-cough, and fever, and one from diarrhœa. The death-rate from all causes was equal to 34·1, and from zymotic diseases to 2·6 per

1,000. If there be no error in these facts the death-rate in Bangor was higher last quarter than in any other of the fifty watering places. The deaths in Bangor sub-district during the first quarter of this year were twenty-two below the average for the corresponding quarter in the three previous years; but included three from whooping-cough, two from scarlet fever, and one from fever. We may note, too, that in the June quarter of 1874 the death-rate in Bangor sub-district was so low as 18·0, and the zymotic rate 0·8. The rates in Bangor were far less favourable during the three months ending June 30 last than in the same period of last year.

45. LLANDUDNO.—The town of Llandudno has overgrown the boundaries of the improvement district, and Dr. James Nicol, the medical officer of health, estimates its present population at 3,791. Estimated by the usual method, the population of the improvement district would be 3,119, therefore 672 may be taken as the population of that portion of what Dr. Nicol calls Llandudno proper, which extends beyond the boundaries of the improvement district. During the second quarter of this year twenty-eight deaths were registered within Dr. Nicol's boundaries of Llandudno, and the annual death-rate was equal to 29·6 per 1,000. At first sight this appears an alarmingly high death-rate, and the inquiry is naturally suggested as to its cause. It is reassuring to find that Dr. Nicol, in his quarterly report to the Town Commissioners, with a copy of which he has favoured us, states that not one of the twenty-eight deaths were referred to any of the principal zymotic diseases. With regard to the high death-rate, Dr. Nicol observes that nine of the deaths were of visitors, 'not one of whom was in sound health on arrival, most of them labouring under mortal maladies from which they could not have long survived anywhere.' Excluding these nine deaths of visitors, the death-rate in Llandudno during the three months ending June last would be reduced to 20·1 per 1,000. The plea urged by Dr. Nicol in justification of such a convenient operation for the reputation of the place is, that whereas Llandudno now contains probably about 7,000 visitors, no account is taken of them in the estimate of population; for when the Census was taken in April, 1871, no visitors, or scarcely any, were present in the town. It appears reasonable to urge that if visitors are not counted in the population, their deaths should also not be counted when the death-rate is calculated. On the other hand, if the principal of manipulating the facts for the calculation of local death-rates, by such an indefinite operation as the exclusion of deaths of visitors were once recognised, all the value of such facts and rates would be at once imperilled. The circumstances connected with the Llandudno death-rate during the second quarter of this year will form a fitting subject for discussion, when the subject of the calculation of death-rates for watering places and other health resorts engages the attention of the Social Science Association in October next. Dr. Nicol remarks that in a place like Llandudno the period of a year is a much sounder basis for the calculation of a death-rate, in which opinion we entirely agree; the use of a quarter's death-rate, however, for our present purpose is obvious, as one of the principal objects of this return is to show whether these watering places have recently been free from the prevalence of zymotic disease. Dr. Nicol calculates the death-rate of Llandudno during the year 1874 at 16·5, but he does not inform us whether any deaths of visitors have been excluded in the calculation of this low death-rate. The recent high death-rate in Llandudno need cause no alarm among intending visitors, as we are assured that not a single death was referred to any zymotic disease; from Dr. Nicol's facts, which are very circumstantially stated, the excessive rate appears almost entirely due to a chance number of invalid visitors having died during the quarter.

46. RHYL.—It would have been interesting to turn from the consideration of the recent death-rate in Llandudno to that of its neighbouring watering place, Rhyl. Owing, however, to a recent change of medical officer of health in the latter town, we have been unable to obtain any information bearing upon its recent mortality statistics. The improvement district of Rhyl has a population which may now be estimated at 4,660. The entire registration sub-district of St. Asaph, which is taken by the Registrar General to represent Rhyl as a watering place, cannot be accepted as satisfactory for the purpose, as the sub-district extends over an area of more than 30,000 acres, and includes the city of St. Asaph itself, which is several miles distant from Rhyl. When, therefore, we turn to the Registrar General's quarterly return for the three months ending March last, and find that five deaths from scarlet fever were registered in St. Asaph sub-district, it might be mischievously delusive to assume that scarlet fever was then fatally prevalent in Rhyl, although such may have been the case. On this account we all the more regret that circumstances should have prevented us from giving more recent statistics for Rhyl, which are, however, promised to us on a future occasion by the present medical officer of health, Dr. A. E. Lloyd.

47. SOUTHPORT.—This flourishing Lancashire watering place constitutes a municipal borough, and its resident population may be estimated at 24,400 persons. It will be seen that no information relating to the recent statistics of health and disease in Southport are contained in our table. Dr. Vernon, the medical officer of health to the borough, in replying to our circular, objected to furnish any contribution to a table of statistics of watering places, on the ground that such statistics are, in his opinion, entirely misleading, and can assist to no useful result. This branch of vital statistics appears to Dr. Vernon hoplessly useless, because the figures cannot be invested with scientific accuracy, and because in many cases improper uses have been made of mortality statistics, especially in watering places. We agree with much that Dr. Vernon urges as to the difficulties of the subject, but we rather think that its very difficulties render it all the more worth discussion. We are, moreover, strongly convinced that very far more good than harm has been effected by the publication of death-rates, even respecting watering places, fully disposed as we are to freely acknowledge their crudeness, and the considerable element of error which they at present contain. As regards the health of Southport in the second quarter of this year we can for the reason above mentioned say nothing, which we the more regret because it appears from the last published quarterly returns of the Registrar General that in the first three months of this year the deaths in the township and registration sub-district of North Meols, which contains the borough of Southport, 183 deaths were registered, showing an excess of forty-four upon the average number returned in the corresponding quarter of the last three years. This excess was caused by the fatal prevalence of zymotic disease, as fifteen deaths were referred to scarlet fever, nine to measles, four to fever, and two each to whooping-cough and diarrhœa. This fatality of zymotic disease may have declined since the end of March, and it may have increased; and without seeking for any further use of such facts as we publish in our table, we cannot but consider it important both to the reputation of a large and popular watering place like Southport, and to its intending visitors, that authentic statistics giving trustworthy information as to the prevalence of zymotic disease in the town should be widely available. We are locally informed in an unofficial manner that the recent prevalence of zymotic diseases in Southport has considerably declined, but we should have liked to publish this important information 'on authority.'

48. LYTHAM.—So far as we are informed, this pretty little retired watering place has no defined boundaries. We have, therefore, accepted the township of Lytham as representing the watering place. The population of the township may be estimated at 4,252 persons, and the twenty deaths registered therein during the three months ending June last were, therefore, equal to an annual death-rate of 18·9 per 1,000. The medical officer of health states that a considerable proportion of the deaths are of

visitors, but the information on this point is too indefinite for more detailed reference. The fact, however, that not one of the twenty deaths was referred to any of the principal zymotic diseases is satisfactory evidence of its sanitary condition. It should also be stated that the deaths of Lytham paupers which occurred at the union workhouse at Kirkham have been brought into account.

49. BLACKPOOL.—This prosperous watering place, which, till lately, was only a local board district, has recently been incorporated, and has attained the dignity of a borough. Much has been said, both in and out of Blackpool, as to the number of its present population. The population of the local board district of Blackpool increased from 3,506, in 1861, to 6,100 in 1871; that is, nearly doubled itself in the ten years. By applying this high rate of increase to the population in 1871, and raising it proportionally, the estimate of the population of the district in the middle of this year is 7,719. Locally, however, this estimate of the resident population is considered too low, and an attempt to take a local census of the town when full of visitors has filled the public mind with all kinds of extravagant numbers up to 30,000. In order to check the approximate accuracy of our estimate of the present population of the district of Blackpool, we have obtained locally the number of inhabited houses in 1871 and 1875, and assuming that the resident population has increased in the same ratio as the inhabited houses, would make the estimate of the present population 7,282, or 437 less than the previous estimate by the more usual method. While, therefore, there seems reason to believe that the high rate of increase which prevailed between 1861 and 1871 has since been maintained, there appears to us to be no ground for the assertion that the estimate we have adopted is too small. During the three months ending June last thirty-four deaths were registered in Blackpool, and were equal to 17·7 per 1,000 of the above-mentioned estimate of population, 7,719. Four deaths during the quarter were referred to zymotic diseases, including two from whooping-cough and one each from small-pox and diphtheria. The annual zymotic rate was therefore equal to 2·1 per 1,000. The medical officer of health (Mr. P. Hinckes Bird) states that the fatal case of small-pox was imported from Stockport, where the disease has been fatally prevalent. The before-mentioned figures for Blackpool form the best answer to the mischievous reports that fever and small-pox are raging in the town. The health of Blackpool is far more satisfactory, and the town far more free from the prevalence of zymotic disease than it was in the corresponding quarter of 1874.

50. FLEETWOOD.—This is the last in our list of the fifty English watering places, which have been ranged in geographical order, from Whitby on the north-east, following the coast round England and Wales, and ending with Fleetwood on the north-west. The local board district of Fleetwood contains an estimated population of 4,708 persons, among whom twenty-nine deaths were registered during last quarter, showing an annual rate of 24·7 per 1,000. Two fatal cases of scarlet fever and one of fever were recorded within the town, the zymotic rate being equal to 2·6 per 1,000. The health of Fleetwood is far more satisfactory than it was in the June quarter of last year; but those who know the town will best know how much remains to be done before its sanitary condition can be pronounced as satisfactory. The medical officer of health (Mr. P. Hinckes Bird) has frequently pointed out in his periodical reports, the sanitary work which is most urgently needed; but it still remains for the local board to carry it out.

In thus completing our notes upon the recent health of these fifty English watering places, it may not be out of place briefly to notice the results of our endeavours to obtain information relating to them. With reference to thirty-five we obtained all the figures we asked for, and the information relating to them is inserted in our table. No medical officer of health exists in Cowes, a new officer has just been appointed in Rhyl, and Exmouth can scarcely be said to have the advantage of one. From different reasons the medical officers of Hornsea, Eastbourne, Worthing, and Littlehampton were unable to supply us with the information asked for; and the officers of Folkestone and Southport declined for different reasons to co-operate with us. We regret to say that three applications to the medical officers of Cromer, Walmer, Ventnor, Torquay, Penzance, and Beaumaris failed to elicit any reply. In conclusion we must again express our gratitude for the courteous assistance we have received from so many medical officers, without which the publication of the foregoing trustworthy information would have been impossible; information which is full of public as well as local interest.

THE
SANITARY RECORD.
SATURDAY, JULY 31, 1875.

Notes of the Week.

THE Leamington Urban Sanitary Authority have increased the salary of Mr. Joseph S. Baly, the medical officer of health, from 50*l.* to 80*l.* per annum.

A CONVALESCENT Home at Ilkley for the accommodation of sixty inmates was formally opened last week by the wife of Mr. C. Semon, by whom it has been built at a cost of 8,000*l.* A small sum will be charged to those who use it, to avoid the taint of charity and foster a feeling of independence.

ATHENRY.

WE have received a long letter from Mr. Robert Irving of Athenry, giving an account of the difficulties with which he had to contend in the erection of the small-pox hospital at Athenry, which has been the means of checking the spread of the epidemic and isolating the patients.

It appears that Mr. Irving was induced to undertake the erection of the hospital after two builders had failed to carry out the work, one having declined and the other having been unable to get labourers, who refused to go near the place. Mr. Irving was then induced to undertake the contract, and at first had to work himself alone for several days, his men having declined. His example, and the promise of high pay, however, stimulated a few labourers to assist him, and in time all difficulties were surmounted, and the hospital opened for the reception.

Mr. Irving complains that the guardians have now referred his account to arbitration instead of settling the amount at once. We cannot, of course, enter into the merits or demerits of this dispute. It appears to us, however, that the important nature of the work accomplished by the contractor at a time of panic, and in the face of great difficulties and at some personal danger, merits a prompt and liberal recompense.

The small-pox epidemic in the town is steadily decreasing, but we regret to learn that several cases have occurred in the neighbourhood in spite of the policy of isolation which has been so carefully carried out. Two more deaths have occurred since our report was published on the 10th inst.; one, we believe, on the day our commissioner left Athenry. We are sorry to hear an unpleasant report about the nursing of the patients at the temporary hospital, but we understand measures have been taken to prevent any irregularity in future.

SKIPTON AND SETTLE, YORKSHIRE.

DR. WEST SYMES, the medical officer of health for this combined district (area 303,621 acres, with a population for 1875 estimated at 49,170) reported at recent meetings of the various sanitary authorities that the mortality during the quarter ending June 30 was at the rate of 18·71 per 1,000 per annum. This satisfactory low number was notwithstanding the fact that scarlet fever had been epidemic in several parts of his district, and had caused eighteen deaths. There had also been several cases of small-pox in Skipton, in all of which Dr. Symes had traced the infection to Keighley—the town in which there has been a very severe epidemic of small-pox (not yet completely stamped out) and the guardians of which union have become so notorious by their opposition to the Vaccination Acts.

OPEN SPACE (METROPOLIS) No. 2. BILL.

THE short bill introduced by Mr. Whalley for affording facilities to vest in the Metropolitan Board of Works open spaces for exercise and recreation, deserves a better fate than seems likely to befall it in the course of the ensuing slaughter. The bill, however, has the rare merit of brevity and comprehensiveness; and it is, moreover, a measure that is greatly needed. The utilisation of waste grounds in and around the metropolis is what we have long advocated; and this bill, if it were carried, would be invaluable, by granting to the Metropolitan Board of Works the means of converting what are now 'howling wildernesses' into places of health and beauty.

The following is the text of the bill in question.

'The Metropolitan Board of Works may, by purchase, or by the gift of the person or persons entitled to the same, acquire or accept the ownership of any open spaces, whether inclosed within rails or palings, or uninclosed, situated in the metropolis, and hold the same in trust for the perpetual use thereof by the public for exercise and recreation, and may from time to time make by-laws for the regulation of such open spaces, and may by such by-laws provide for the removal of any person infringing any such by-law by any officer of the said board or police constable. By-laws under this section shall be made in the same manner and subject to the same conditions as by-laws made by the said board under the Metropolis Management Act, 1855.

'Where any open spaces now or hereafter used as places of exercise and recreation for the inhabitants of certain houses, and of which the property and right of user is now or hereafter may be vested in one or more persons as owners of such houses, the owners or other persons interested therein may convey to the Metropolitan Board of Works, in trust for the public, the right to enter upon and use and enjoy such open spaces, subject to such terms and conditions as may be agreed upon by such owners and other persons and the said Board of Works.

'The Metropolitan Board of Works shall be entitled to make such provision as may be necessary for maintaining and protecting the open spaces so acquired by them.

'The Metropolitan Board of Works shall be empowered to pay out of the funds at their disposal or which they are empowered to raise under the said Metropolis Management Act, 1855, and the several Acts amending the same, the cost and charges which they may incur in the execution of this Act, and such costs and charges shall be deemed to be expenses for which provision is made by such Acts.

'This Act shall not extend to the royal parks, nor to any garden, ornamental ground, or ornamental land belonging to her Majesty in right of her crown or of her Duchy of Lancaster, or any garden, ornamental ground, or ornamental land for the time being under the management of the commissioners for the time being of her Majesty's works and public buildings, or of the commissioners for the time being acting under the Crown Estate Paving Act, 1851.'

KITCHEN BOILERS.

THE town council of Salford have appointed a committee to consider the question whether it is requisite that kitchen boilers should be fixed under official inspection. Many will think that the powers of inspection possessed by urban sanitary authorities are already large enough, and will not approve of any further extension except it be for quasi-medical purposes. Be this as it may, there is no doubt that the cases are more frequent than many imagine of damage to life and property arising from kitchen boilers being improperly fixed, and that official inspection would materially lessen the number of such cases.

POISONOUS SWEETS.

AT the Bradford Police Court, C. F. Greeb was charged with selling comfits adulterated so as to be injurious to health, and known by the name of 'green peas.'

Mr. Rimmington, the borough analyst, stated that the 'green peas' were a sweetmeat, and were injurious to health, if eaten. The green colouring matter with which they were coated was formed of chromate of lead, which was poisonous, as were all lead compounds. The internal portion of the 'peas' was harmless.

Defendant was fined 10*s.* and costs, or fourteen days' imprisonment.

INTERESTED MEMBERS.

A CASE has just been decided at the Bradford County Court, on the question of interest in contracts by members of municipal corporations. A member of the town council for that borough, Mr. Thornton, was proceeded against by Mr. Hope, architect, for having acted as councillor while disqualified from doing so by reason of his having an interest in certain profits under the corporation. Mr. Thornton is a contractor, and it was proved that he had received payments for allowing the corporation to deposit rubbish on land belonging to him.—The judge held that the defendant was disqualified from being elected, and inflicted a penalty of 50*l.*

'CHEAP' INSPECTORS OF NUISANCES.

THE rural sanitary authority of Kingston-upon-Thames have subjected themselves to adverse criticism in connection with the appointment of an inspector of nuisances. Hitherto they have had four inspectors, to whom they have paid salaries amounting to 186*l.* per annum. The arrangement was not considered satisfactory, and the sanitary authority determined to appoint one officer for the entire district, at a salary of 180*l.* per annum; and it was further agreed to obtain from Parliament the repayment of half of the salary. The Local Government Board assented, and the sanitary authority advertised for candidates. On the day fixed for the election about sixty offered themselves, and more than half attended the meeting convened 'to proceed to the election.' The Rev. J. Burrow, vicar of Hampton, moved the adjournment of the question for three months, and notwithstanding the action already taken, the motion was carried. The only grounds on which the motion was based were (1) that impending legislation rendered it unadvisable to make any alteration, and (2) that the salary proposed was extravagant. What the impending legislation is is not clear, and as to the salary with the repayment from the Parliamentary grant, the cost to the union would be even less than at present. The sanitary authority have not only stultified themselves in this matter, but have acted very unfairly to the large number of candidates.

Special Report.

WOODHALL SPA, NEAR HORNCASTLE.

By R. CUFFE, M.R.C.S. Eng.

IT has been advanced by authorities worthy of every respect that a rainy season is productive of health, and that the mortality is in an inverse ratio to the amount of rainfall. With all due deference I shall nevertheless endeavour to prove from statistics that quite a contrary result ensues. I readily admit, however, that in towns and cities with their subterraneous network of more or less perfect or imperfect systems of sewerage, the flushing of these by frequent showers is conducive to the health of the inhabitants, but this is narrowing the proposition from within the scope of proper scientific observation.

A paper on the rainfall of England, by S. M. Miller, Esq., F.R.A.L.F.M.S.,* shows that England may be conveniently divided into four regions.

1. North-west, in which the annual fall ranges between 50 and 160 inches.

2. Wales and south-west, in which the annual fall ranges between 40 and 50 inches.

3. The centre of England, from Yorkshire to Sussex, in which the annual fall ranges between 30 and 40 inches.

4. East of England, from the Tweed to Kent, in which the annual fall ranges between 20 and 30 inches.

The paper further shows that the central district of the fourth division has the least annual rainfall, and is the driest region in England.

The average annual rainfall for the ten years 1861-1870, was as follows: Fakenham, 25·0 in.; Wellingborough, 22·8 in.; Royston, 22·2 in; Holkham, 20·4 in.; Northampton, 23·5 in.; Bury St. Edmonds, 22·3 in.; Bedford, 21·0 in.; Boston, 21·9 in.; Grantham, 21·1 in.; Lincoln, 19·7 in.

The average of these ten is about twenty-two inches; the mean rainfall of England is nearly thirty-one inches; therefore the mean rainfall of the East Central district of England is about nine inches in defect of the mean of the whole country; as the mean rainfall of the three latter places in Lincolnshire is 20·9, and its Woodhall Spa is situated nearly equidistant, we may safely say that less rainfall occurs there than in any other locality in the United Kingdom.†

I shall now proceed to give a table, showing the mortality to every 1,000 persons living in various districts in England and Wales from the Registrar General's Quarterly Reports, by which it will be seen that the eastern division shows the lowest death-rate, which gradually rises as we advance towards the west, and that the northern counties are higher than the southern. The Lincolnshire county compares favourably with the other divisions; again, if we analyse each district of the latter county, we shall find that the district of Horncastle, in which Woodhall is situated, with a population of 23,764 in 1871 had only a death-rate of 14·644, against the United Kingdom 22·4 for the ten years ending 1873.

Woodhall with a population last census of 326, had only four deaths in the year ending 1874, being a death-rate of 12·269. Kirkstead, the adjoining parish to Woodhall Spa, with a population of 148, had only two deaths in the year ending 1874, being a death-rate of 13·513 to a thousand living.‡

For convenience I have divided England and Wales into three divisions from north to south; the western division from a line drawn from the Mersey to Weymouth; the eastern from the Humber to Kent; and the third or middle portion between the two.

Western Division. 1861–70. Ten years' average.		Centre of England. 1861–70. Ten years' average.		Eastern Division. 1871–73. Three years' average.	
North Western (VIII. Division of Tables)	26·3	Northern (X. Division)	22·7	Lincolnshire (VII. Division)	17·9
Welsh (XI. Division)	21·6	York (IX. Division)	24·0	Eastern (IV. Division) 1861–70	20·1
South Western (V. Division)	19·9	North Midland (VII. Division)	20·8	Kent (II. Division) 1871–3	18·0
		West Midland (VI. Division)	21·8		
		South Midland (III. Division)	20·2		
	67·8=22·6		109·5=21·9		56·0=18·6
	Death-rate.		Death-rate.		Death-rate.
The Western District average	22·6	Midland	21·9	Eastern	18·6

	Area in Statute Acres.	Enumerated Population, Census 1871.	Average Death per Annum for the Three Years 1870–73
Horncastle District	113,588	— 23,764	— 348, or 14·644 to 1,000 living persons.
Woodhall District	2,240	— 326 in 1874	— 4, ,, 12·269 ,,
Kirkstead	1,540	— 148 in 1874	— 2, ,, 13·513 ,,

It may be interesting to compare the low death-rate of the Horncastle district, or more especially the district of the Spa, with the returns of several of our larger towns, as well as some of the foreign cities.

Margate	19·564	Buxton	20·259	Eastbourne	20·602
Bristol	24·8	Bath	25·0	Lynemouth	27·7
Nottingham	28·0	Newcastle-on-Tyne	31·7	Manchester	32·5
Liverpool	38·0	Dudley	39·6		
Rome	26·1	Bombay	26·1	Paris	21·8
Berlin	29·8	Hague	28·3	New York	26·7
Calcutta	32·2	Madras	33·1	Rotterdam	30·9
				Munich	35·6

Brighton	21·8	Brussels	24·6
Birmingham	28·2	Copenhagen	26·7
Carlisle	37·9	Amsterdam	31·2

Infant mortality in the Horncastle district was equal to 149·3 deaths under one year of age per annum in which 1,000 living at that age, against 180·4 in the whole of England and Wales.

The annual rate from fever, scarlatina, and diarrhœa—including dysentery and cholera—was respectively 68, 47, and 30 per 1,000, against 88, 97, and 108 in the whole of England and Wales.

Speaking generally, the mortality from diseases of the respiratory organs was considerably below the annual English averages.

From the above carefully prepared statistics of both rainfall and the death-rate we find that in direct proportion to the rainfall so is the death-rate; it not only shows that the eastern division of England has less rainfall and death-rate, but there is a perceptible reduction of both in the county of Lincolnshire, more especially the district of Woodhall Spa. As vital to the proportion I am endeavouring to maintain, it must be borne in mind that Lincolnshire is still supposed by many to be both wet and unhealthy, whereas I have clearly shown from the most reliable sources, that it is the driest district in England, and has the lowest death-rate. A quarter of a century ago the drainage was decidedly very incomplete, since which it

* Read before the Wisbeach District Chamber of Agriculture, July, 1871.

† The Meterological Circular and Weather Report, February, 1875.

‡ Kirkstead parish is contiguous to the Spa district, the outside boundary being distant only one mile and a quarter.

has been so perfected and extended that in some localities an opinion prevails that almost too much has been done for agricultural requirements.

In the Woodhall Spa district we see that the rainfall was 20·9 and the death-rate 12·269 to 1,000 living persons. The United Kingdom shows rainfall 31·0, and the death-rate 22·4 to 1,000 living persons. In the churchyard of the small village of Kirkby, about three miles distant from Woodhall Spa, there are thirty-eight tombstones, averaging seventy-five years, twelve of which averages 83·7 years.

The above statistics are chiefly taken for the ten years' average according to the Government tables; in some instances the tables only give the average of three years, or one year as the case may be, where it has been necessary to show the death-rate of sub-districts.

The death-rate for the quarter now ending, the Government tables show generally a much higher rate; this is attributed to the low temperature during that period, which mainly affected children and elderly people. For the last twenty years never has the mortality been so high during the first quarter.

Chemical Analysis of the Woodhall Iodine Water.

The following official analysis we are able to publish in advance of the Geological Survey Memoir on our district, through the kind permission of the director of the Geological Survey and Dr. Frankland, F.R.S. The survey has been made by Sydney B. I. Skertchly, F.G.S., and will be published.

[COPY.]

Royal College of Chemistry,
South Kensington Museum,
February 13, 1874.

SIR,—The analysis of the Woodhall Spa Water has yielded the following results. 100,000 parts of the water contain :—

	Parts.
Total solids in solution	2361·200
Organic Carbon	·372
,, Nitrogen	·532
Ammonia	·810
Nitrogen as Nitrates and Nitrites	·009
Chlorine	1425·000
Total combined Nitrogen	1·208
Bromine	6·208
Iodine	·880
Arsenicum	·016
Temporary Hardness	20·000
Permanent	245·000
Total	265·000

The water contains unusually large proportions of iodine and of bromine.

I am, Sir, your obedient servant,
(Signed) E. FRANKLAND.

To the Director-General of the Geological Surveys of the United Kingdom.

Parliamentary Proceedings.

HOUSE OF LORDS.

(*Tuesday, July* 27, 1875.)

SCOTCH SANITARY RETURNS.

THE Earl of Rosebery moved for a return from every urban sanitary district in Scotland having more than 5,000 inhabitants, with reference to sewage and manufacturing refuse. The return was agreed to.

HOUSE OF COMMONS.

(*Monday, July* 26.)

RIVERS POLLUTION BILL.

MR. DISRAELI, in answer to Mr. Ripley, said it would be impossible this session to proceed with the Rivers Pollution Bill, and the President of the Board of Trade would take an early opportunity of moving that the order be discharged.

Law Reports.

POLLUTION OF WATER.

1875. *A. G.* v. *Darlington, Mayor.* Pollution of river by refuse from sewage deodorisation works. Injunction granted. (*Times*, March 24, 1875.)

CURIOUS BAD MEAT CASE.

DR. GRIFFITHS applied to the bench for the condemnation of part of a carcass of meat which belonged to T. Hawksley, butcher, Attercliffe.—The town clerk appeared to support Dr. Griffiths, and Mr. Binns appeared on behalf of Hawksley.—Dr. Griffiths stated that he had inspected the carcass, and found it quite unfit for food and unwholesome. The animal had suffered from scrofula.—Mr. Binns then informed the bench that he had witnesses to call to state that the meat was good and fit for food. He asked whether the bench would hear his witnesses or not.—The town clerk said the question was irregular. He had further witnesses to call.—Mr. Roberts said it was their intention to condemn the meat, and then leave Dr. Griffiths to bring a charge against Hawksley at some future time.—Mr. Binns again asked if his witnesses would be allowed to give evidence, but he was told that they would not at that stage.—Mr. Jackson, veterinary surgeon, stated that he had inspected the meat, and it was unwholesome.—This was all the evidence called, and Mr. Binns contended that the bench had no jurisdiction to condemn the meat until his witnesses had been heard.—The bench, however, informed him that he had no right to tender witnesses until a case was made out, and Sir John Brown said it was only a matter of courtesy on the part of the bench that they allowed the discussion at all.—The order of condemnation was then made.

Correspondence.

ADULTERATED BUTTER.

(*To the Editor of the* SANITARY RECORD.)

To those engaged professionally in the pursuit of such subjects it is not a surprising fact that respectable traders are frequently being convicted of selling adulterated butter; but I can quite conceive that to the understanding of the general public, who troubles itself very little about such matters, the statement that mixtures containing less than one-half by weight of genuine butter are being sold freely is startling and almost incredible.

Some facts touching upon this matter have recently been made known to me. Not one hundred miles from the Bargate of Southampton is an establishment where bone manures are made; the bones, obtained from slaughter-houses, knacker-yards, and the old bone men, are boiled down, and the large quantity of fat which naturally rises to the surface is skimmed off and thrown into tubs; when cool, it forms a dark brown grease, having a most offensive odour, and a taste—well, nobody yet has been found with sufficient courage to test its flavour. This vile mixture is sold—to whom? To the railway companies for greasing wheels? No. To steam factories as a lubricator for machinery? No. To soap boilers? No. To wholesale butter factors? Yes! The manager of the works told a friend of mine that many tons per annum were thus disposed of.

Now no chemist will declare this fatty matter to be deleterious to health when eaten, that is after the cleansing processes through which it is made to pass before it becomes butter; but the fact that such a trade flourishes will help to dispel any doubts which may exist in the minds of the public, or of those who hold the proud position of magistrates in town or country, as to whether in every day commercial life, butter is or is not adulterated with foreign fats. ARTHUR ANGELL, Hants County Analyst.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

ANDERSON, Professor Alfred George, has been appointed Public Analyst for the parish of Paddington, vice Hardwicke, resigned : 150*l.* per ann.

CORBET, Mr. David, M.R.C.S., has been re-elected Medical Officer of Health for Kidderminster.

HANDLEY, Mr. Charles, has been appointed Clerk to the Milverton Urban Sanitary Authority, vice Heath, resigned.

HILLSDON, Mr. C. C., has been re-appointed Collector to the Leamington Urban Sanitary Authority.

HOLDERNESS, William Brown, M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Huntingdon Urban Sanitary District : 24*l.* per ann.

JAMES, Mr. Frederick, has been appointed Inspector of Nuisances, for the Uppingham Rural Sanitary District, vice Harvey, resigned.

KAY, Mr. Samuel, has been appointed Inspector of Nuisances for the Ramsbottom Urban Sanitary District.

LLOYD, Albert Eyton, L.R.C.P. Edin., M.R.C.S. Eng., has been appointed Medical Officer of Health for the Rhyl Urban Sanitary District, vice Williams, resigned.

MEAD, Henry Thomas Harvey, M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Christchurch Rural Sanitary District.

POWELL, Joshua, M.R.C.S. Eng., has been appointed Medical Officer of Health for the Penbryn Sub-district of the Newcastle-Emlyn Rural Sanitary District, vice Evans, deceased.

PUGH, Mr. C., has been re-appointed Sanitary Inspector for Kidderminster.

WILSON, James Mitchell, M.B.C.M. Univ. Glasg., has been re-appointed Medical Officer of Health for the North Witchford Rural Sanitary District, at the reduced salary of 40*l.* per ann., Chatteris having been severed from it and formed into an Urban Sanitary District.

VACANCIES.

BERWICK-UPON-TWEED URBAN SANITARY DISTRICT. Surveyor and Inspector of Nuisances : 140*l.* per ann. Applications, August 7, to J. C. and R. Weddell, Clerks to the Authority.

BOOTLE-CUM-LINACRE URBAN SANITARY DISTRICT. Surveyor. 160*l.* per ann. Application, August 2, to T. D. Pierce, Town Clerk.

METROPOLITAN BOARD OF WORKS. Surveyor for the District of St. Saviour, St. George the Martyr, and Christchurch, Southwark, and the northern portion of Lambeth. Application, August 3, to J. E. Wakefield, Clerk to the Board.

PEMBROKE. Certifying Factory Surgeon.

ROCHDALE URBAN SANITARY DISTRICT. Medical Officer of Health : 300*l.* per ann., with office and all office requirements. Application, August 7, to Z. Mellor, Town Clerk.

TREDEGAR URBAN SANITARY DISTRICT. Surveyor.

WESTBURY, WILTS. Certifying Factory Surgeon.

WESTON-SUPER-MARE URBAN SANITARY DISTRICT. Surveyor.

SANITARY PATENTS.

2348. Improvements in the preparation and preservation of food. Donald Nicoll, Clement's Inn, Strand, London.

2350. An improvement in or applicable to pipes for smoking. Alexander Melville Clark, Chancery Lane.

2338. Improvements in apparatus for treating sewage. James Odams, Fenchurch Street, London, and Robert Blackburn, Trews Weir Mills, Exeter, Devonshire.

2406. Improvements in the means and apparatus for producing animal charcoal and other filtering materials for use as purifiers of liquids and gases, and for reviving or restoring the same when exhausted by use. William Alexander Lyttle, Woodstock Lodge, the Grove, Hammersmith, Middlesex.

2412. Improvements in means or apparatus for the manufacture of illuminating gas from petroleum or other hydrocarbon oil. William Brookes, Chancery Lane, London.—A communication from Ernest Jules Jean Baptiste Desiré du Rieux, Lille, France.

2401. Cooling and ventilating mines, etc. Thomas Joseph, Treherbert, Pontypridd, Glamorganshire.

2118. Preserving and deodorising seaweed, etc. Edward Charles Cortis Stanford, Glasgow, Lanarkshire, N.B.

2123. Artificial fuel. Thomas Edward Heath, Thomas Evens, and Thomas Edward Heath, jun., Cardiff, Glamorganshire.

79. Utilising sewage. Francis Gerard Prange and William Whitthread, Liverpool.

877. Consuming smoke and economising fuel. William Denny Ruck, New Cross Road, Kent.

915. Road-sweeping, etc., machines. William Burgess, Peckham.

916. Ventilating mines. William Knott, Wigan, and Thomas Rudd, Blackrod, near Wigan.

934. Earth closets. William Liddiard, Wantage.

ABSTRACTS OF SPECIFICATIONS.

44. Economising fuel. J. Green, Redditch.

This invention consists of a portable and detachable frame of bars or basket which is hooked to or suspended in front of an ordinary grate. The back of the frame or basket is open, and the front is inclined from the flat bottom upwards. By the large surface of burning fuel which is exposed when the apparatus is in use, combined with its projecting position, a large amount of heat is radiated into the room or apartment, and fuel thereby economised.

66. Gas for lighting and heating. J. Kidd, Martin's Lane, London. Partly a communication from L. Arnold, New York.

The novelty of this invention consists, first, in the manufacture of lighting or heating gases in carbon, then carburetting this gas with hydro-carbon vapour, after which the inventor passes the carburetted gas through a red hot retort : by this means he makes the mixture a fixed incondensible gas of high illuminating power. The second part of this invention consists in a novel arrangement and method of setting the retorts. He connects together two or three horizontal gas retorts, one above another, with only one stand pipe or gas outlet leading to the hydraulic main from the combined retorts ; when using three retorts the gas from the lower retort must pass over the coal placed in the two upper retorts, or the gas from the upper retort before escaping, may be forced downwards over the coal in the lower retorts. All the retorts should be charged with coal and operated in the ordinary way.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer —not necessarily for publication.

POWER OF PLANTS TO EXHAUST THE WATER OF SOILS.

DR. R. HEINRICH states that plants differ in their power of utilising the water of the soil. In peaty soils barley withered when the soil contained 47·7 per cent. of moisture, and rye at 53·4. In a lime soil maize faded at 8·6, and horse beans at 12·7 per cent. The hygroscopic moisture of soils does not appear available for the growth of plants.

DETERMINATION OF OZONE IN THE AIR.

PROFESSOR PETTENKOFER and Dr. Wolfhügel have been making experiments with a view of determining ozone in the atmosphere. Pettenkofer points out as a great defect that in exposing ozone papers to the air, no attention is paid to the volume of air which sweeps over them in a given time. Wolfhügel found that 1,000 litres of air, taken in the open air, produced a reaction with paper dipped in iodide of potassium and starch. But the air of houses, even from uninhabited and well ventilated rooms, produced no reaction even when 10,000 to 12,000 litres were passed over the paper. Ozone was also found wanting in subterranean air.

MORBID APPETITES.

LEUSINGER, in his 'Travels on the Amazon and Madeira,' speaks of the appetite for clay shown by the inhabitants of the virgin forests traversed by these rivers. This propensity is common to all ages from childhood to old age, and is so strong that the prospect of a miserable and dreadful death cannot withhold them from satisfying this morbid taste. It is not uncommon to see, amongst the negroes employed on the coffee and sugar plantations an unfortunate being working in the heat of the day with an iron mask over his face ; this is a clay-eater, whom it is sought to save from his deplorable propensity by this means, and who is never allowed to take off his mask except under proper superintendence. This taste, however, is not peculiar to man in these regions. Many animals, and even birds, also show it, of which advantage is taken for hunting purposes. The hunter has only to place himself in ambuscade near a clay pit, on a moonlight night, and he will soon have plenty of sport among the wild boars and roe-deer, as well as the jaguars, which are attracted, not by the clay, but by the desire for a living prey.

Communications have been received from :

Dr. Macpherson, London ; Mr. Plimsoll, M.P., London ; Dr. E. F. Fussell, Medical Officer of Health, Brighton ; Mr. C. Solomon, Medical Officer of Health, Skirlaugh ; Mr. D. S. Skinner, Medical Officer of Health, Lyme-Regis ; Mr. C. Kelly, Medical Officer of Health, London ; Dr. Griffiths, Sheffield ; Mr. A. F. Asher, Guildford ; Dr. T. K. Chambers, London ; Dr. Alyton Lloyd, Rhyl ; Dr. Tizard, Weymouth ; Dr. Griffiths, Sheffield ; Dr. Edwin Jeffery, Lowestoft ; Mr. A. Greaves, Sheffield ; Dr. R. Cuffe, Woodhall Spa, Horncastle ; Mr. Humphreys, Bangor ; Dr. J. M. Fothergill, London ; Mr. Bennock, London ; Dr. T. K. Chambers, London ; Dr. Henry J. Vernon, Clitheroe ; Mr. J. J. Ritchie, Medical Officer of Health, Leek ; Mr. W. Keith, London ; Mr. G. F. Chambers, Eastbourne ; Dr. Alfred Mayo, Medical Officer of Health, Mildenhall ; Mr. John A. MacKendrick, Edinburgh ; Mrs. S. Dalrymple, Norwich ; Mr. S. B. Blackett, London ; Mr. N. Humphreys, London ; Mr. John Pearson, Hayton ; Mr. Thos. Reid, Kirkby Lonsdale ; Mr. H. K. Hebb, Lincoln ; Dr. E. West Symes, Skipton.

NOTICE.

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Reading Covers to hold 12 *numbers of* THE SANITARY RECORD *have been prepared, and may be had direct from the Publishers or through any Bookseller, price 3s. each.*

Original Papers.

HYGIENE.

BY F. S. B. F. DE CHAUMONT, M.D., Edin.
Staff-Surgeon Major, Assistant Professor of Military Hygiene, Army Medical School, Netley.

CHAPTER IV.—HABITATIONS.—*Continued.*

II.—VENTILATION.

A. *General Principles.*

BY ventilation we mean such a continuous change of air in an air-space as will keep its atmosphere at a certain degree of purity, without producing draughts that shall be dangerous, unpleasant or even perceptible. It is important that this proposition should be distinctly established and thoroughly understood, for we not unfrequently hear people say, 'O, I don't like ventilation, it always gives me cold.' If change of air and draughts are to be held inseparable from each other, then the objection is just enough, for few persons will voluntarily submit to a chilling draught even with the knowledge of the danger of vitiated air. On the other hand I have already pointed out that it is less the draught itself than the poisonous influence of the vitiated air that does give cold. But it cannot be too much insisted upon that ventilation not only does not mean draughts, but is actually opposed to them.

There are three points to be attended to in ventilation: 1. A sufficient and constant supply of fresh air. 2. A proper temperature. 3. An absence of perceptible currents or draughts. To obtain these we must have such arrangements as shall ensure that air is brought in continuously by either artificial or natural channels; that the warming apparatus be properly regulated, and that the apertures be sufficiently large and numerous to allow the fresh air to be brought in at a moderate velocity. It may be well, before discussing the question of methods of ventilation, to deal with the latter points, namely, the temperature and velocity of air-currents and the size of openings required for the introduction of air.

1. *Temperature.*—As a general principle, the temperature of houses is kept too high, and as this is usually accompanied with insufficient change of air, frequent catarrhs and colds in various forms are the consequences. For a sitting-room, under ordinary circumstances, an uniform temperature of 60° Fahr. to 62° Fahr. (15° to 16° Cent.) is sufficient; for a sleeping-room even a lower temperature is admissible, as it is easy to supplement it by additional coverings. This is especially the case in illness, where a free supply of fresh air is always desirable, even when it must be obtained at some sacrifice of temperature. At the same time, there are some cases, such as bronchitis, whooping-cough, and convalescence from exhausting diseases, where a moderate degree of warmth must be kept up. Infants and aged persons also require a higher temperature than healthy adults, but in these cases much may be done with clothing. In a workroom a lower temperature even than 60° Fahr. is often desirable, and this applies both to manual labour and to head-work. It is here that the question of cubic space comes to be considered in a practical point of view, for of course the expense of warming is increased by giving additional cubic space. On the other hand, ventilation of small spaces without draughts is extremely difficult and is generally practically given up in too many cases.

2. *Velocity of Air-Currents.**—When the temperature of an air-current is moderate, that is, when it does not materially differ from that of the air-space in which it moves, a considerable velocity can be borne by the human body. This, of course, applies to ordinary temperatures, for in extremes of either heat or cold, the current becomes disagreeable and ultimately unbearable. Usually a current at the rate of one and a half to two feet per second, equal to walking through still air at the rate of one to one and a half miles per hour, is hardly perceived; two and a half to three feet per second is distinctly perceptible (equal to walking one and three quarters to two miles per hour in still air); and four to five feet per second (equal to walking two and three quarters to three and a half miles per hour) is a positive draught. Our object, therefore, ought to be in supplying an air-space with fresh air, to take care that the current should nowhere exceed two feet per second in the room itself, and should be kept as near as possible at five feet per second at the point of entrance. Could we succeed in this we should accomplish the great end in view, a constant and uniform diffusion of fresh air in our air-space, thus ensuring that at no time there shall be an undue accumulation of organic poison.

3. *Size of Ventilation Openings.*—I have already shown that 3,000 cubic feet per hour are necessary for each occupant of an air-space to preserve good hygienic conditions, and it will therefore be easy to calculate the size of the openings required for its entrance. If we had an opening of one square foot of area, and the air coming in at five feet per second, this would obviously give us five cubic feet of air per second, or, as there are 3,600 seconds in an hour, $5 \times 3{,}600 = 18{,}000$ cubic feet of air per hour. But as we ask for only 3,000 cubic feet for each person, one-sixth of this will be enough, $\frac{18{,}000}{3{,}000} = 6$, so that instead of the opening requiring to have a sectional area of one square foot, it will be necessary to have only one-sixth of a square foot, or twenty-four square inches. Again, it being quite obvious that if a certain amount of air finds its way in an equal bulk of air must find its way out, we must have at least as much opening for the exit as for the entrance of air, so that altogether the sectional area of ventilation openings require to be one-third of a square foot, or forty-eight square inches, for each occupant of an air-space. Of course, where more air is required (as in the case of the hourly respiratory impurity being taken at 0·7 instead of 0·6 cubic feet, or in the case of epidemic or other disease) a larger sectional area would be necessary, but the above may be taken as a general statement of the question, applicable, with proper variations, to most individual cases.

Certain further limitations, however, require to be noticed here, and these are chiefly connected with the loss due to friction. If we have an opening of tolerably large area, and determine the mean velocity of the current, we shall get pretty nearly the calculated amount of air; but if the opening be divided into two or more, or if it be irregular or

* The best means of ascertaining the velocity of air-currents is by the small air-meter invented by Mr. L. Casella, Holborn Bars.

interrupted by gratings or louvres, there will always be a proportionate loss, which requires to be allowed for. To this point we shall return presently.

B. *Practical Ventilation.*

This is generally divided into natural and artificial, whilst the latter is again divided into the methods by propulsion and extraction. It is, of course, impossible to separate these completely, as they are, to a greater or less extent, interdependent, but the division is a tolerably convenient one.

1. *Natural Ventilation.*—This is accomplished by the movement of air caused by the difference in weight of the columns of air outside and inside an air-space; by the effects of wind blowing directly into a space; or by aspiration, that is, the action of winds blowing across an opening and sucking air out of it. The influence of wind is very important, especially when we wish to flush thoroughly an air-space, whilst the accessory help it gives by aspiration is decidedly valuable. At the same time it will be easily understood that nothing like constant dependence can be placed upon the action of the wind, its action being so variable. On the other hand it sometimes actually interferes with the operation of other methods of ventilation, and has to be counteracted accordingly. But the movement, consequent on difference of temperature, is tolerably constant, and must, therefore, be mainly depended upon in natural ventilation. The method of calculating the quantity of air to be thus obtained is called the formula of Montgolfier, and depends upon certain data, viz.:—

1. The temperature of the external air.
2. The temperature of the internal air (or air of room).
3. The ratio of expansion of air by heat = 0·002 for one degree Fahrenheit.
4. The height of the column of internal air, from the floor of the room to the point of exit.
5. The rate at which a falling body is attracted by the force of gravity = 8.
6. The sectional area of the channel or aperture.
7. A variable coefficient for loss by friction, depending on the shape and size of the aperture or channel through which the air passes.

Nos. 3 and 5 are constant, and are 0·002 and 8 respectively.

The difference of the temperature (1 and 2) is found by inspection of ordinary thermometers, and multiplied by nos. 3 and 4; the square root of the product is then taken and multiplied by nos. 5, 6, and 7; the result is the amount of air in cubic feet that enters and leaves the air in one second; multiplied by 3,600 we have the amount in one hour. For instance, suppose we have a room, the temperature of which is 62° Fahr., while the thermometer in the outer air marks 45° Fahr.; the difference here will be 17° Fahr. If now the height of the inner

H \ T	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	16°	17°	18°	19°	20°	25°	30°	T \ H
55	267	293	317	338	358	377	396	414	431	456	464	478	491	504	520	540	588	655	55
50	254	279	301	322	341	360	377	394	401	426	441	455	469	483	496	509	569	625	50
45	241	264	286	305	324	341	358	374	389	404	418	432	445	458	471	483	540	591	45
40	228	249	269	288	305	322	338	353	367	381	394	407	420	432	444	455	509	558	40
35	213	233	252	269	286	301	316	330	343	350	369	381	393	404	415	426	476	522	35
30	197	216	233	249	264	279	292	305	318	330	341	353	363	374	384	394	441	483	30
25	180	197	213	227	241	254	267	279	290	301	312	322	332	342	351	360	402	441	25
20	161	176	190	204	216	228	239	249	259	269	279	288	297	305	314	322	360	394	20
15	139	153	165	176	187	197	207	216	225	233	241	249	257	264	272	279	312	341	15
10	114	125	135	144	153	161	169	176	183	190	197	204	210	216	222	228	254	279	10
H \ T	5°	6°	7°	8°	9°	10°	11°	12°	13°	14°	15°	16°	17°	18°	19°	20°	25°	30°	H \ T

column of air to the top of the chimney be, say thirty feet, we shall have 17 × ·002 × 30 = 1·02. Now the square root of this would be 1·01, and this multiplied by 8 would give us 8·08, the velocity of the air-current in feet per second. If then the sectional area of the chimney be half a square foot, we have 8·08 × 0·5 = 4·04 cubic feet per second passing out of the chimney; but in most cases there is a loss of at least one-fourth by friction, so that the true amount will probably not exceed 3·03. We have now to multiply this by 3,600, or the number of seconds in an hour, and we have 10,908 cubic feet per hour passing out by the chimney, and of course as much fresh air coming in by some other channel. The table* given above will show a few examples, the horizontal lines along the top and bottom giving the difference of temperatures outside and inside, and the perpendicular lines at the sides the height of the internal column of air in feet. The number at the junction of any two lines gives the amount of air in cubic feet per minute for a sectional area of one square foot, one-fourth being deducted for friction.

To find the amount per hour we have simply to multiply by 60, and if the sectional area of the opening be less or more than one square foot, we have also to multiply by the area stated as a decimal fraction of a foot. Thus, if we have a chimney, the sectional area of which is 65 square inches, we should put $\frac{65}{144}$ = 0·45 of a square foot. If now the height of our column of air from the floor of the room is 35 feet, and difference of temperature 12° Fahr., we take out from the table 330 (under 12° and opposite 35 feet), which we multiply by 60 to get the quantity in an hour, = 19,800 cubic feet, and again by 0·45 = 8,910 cubic feet, the amount passing hourly through our chimney of 65 square inches sectional

* For this table in a more extended form, see Dr. Parkes's 'Manual of Practical Hygiene,' p. 167.

area. Of course this would be true for the individual case only; and to get the average amount of change of air in any room for a period we should require to determine the average temperatures outside and inside, which could be easily done by making repeated observations with an ordinary thermometer during a fixed period, and dividing the sums of the observations by the number of separate observations. Thus, a series of six observations as follows might be got:

Inside.	Outside.
61°	50°
60°	52°
59°	47°
58°	44°
60°	49°
62°	51°
sum = 360°	sum = 293°

The number of separate observations is six, so we divide each sum by 6, which gives us:

Inside.	Outside.
6 | 360°	6 | 293°
60° = mean temperature.	48·8°, say 49°, = mean temperature.

The mean or average distance would thus be 60° less 49°, or 11°, from which, by means of the table, we could find the average condition of ventilation through the existing apertures. It may here be mentioned that the whole mass of air in a room is taken as homogenous, and that the height of the air-column is always taken to be from the *floor* of the room, wherever the outlet in the room may be. Thus the opening of the outlet in the room may be in the fire-place, near the ceiling, or at the floor; but the distance between the lower part of the column of air (that is, the floor of the room) and the point of delivery into the open air (the top of the chimney or ventilating tube whatsoever) remains unaltered. Nothing, therefore, can change this, except an actual lengthening or shortening of the chimney or ventilating tube; but where the opening in the room goes *straight* into the open air, without passing through a tube, then the height of the column of air is to be reckoned from the floor of the room to the opening.

It is upon the above principles that the whole system of natural ventilation is based, all other questions being those of detail as to the form and size of openings, and their best mode of distribution in the inhabited air-space. I shall now proceed to consider a few of these points.

THE INFLUENCE OF HYGIENE ON CONSUMPTION.

By A. RABAGLIATI, M.D.

THE *Correspondenz-blatt*, of the Lower Rhine Institute for Public Hygiene, contains an article by Professor Rühle, of Bonn, entitled 'What can Public Hygiene accomplish towards the stamping-out of Consumption?'

After having reviewed the causes of consumption, the author insists, as prophylactic against the disease, on the need for wholesome food and fresh dry air, and thinks that medical men should direct the attention of parents and teachers to the necessity for the free use of the lungs by the children of both sexes; and also by workmen engaged in certain occupations, as for instance tailors, shoemakers, watchmakers, weavers, clerks, etc. He proposes to effect the latter by such alterations in the benches, tables, etc., at which some of these persons work as will give their respiratory muscles freer play. Finally, he asks the question whether society would not be entitled to demand from persons about to marry a 'certificate of health' before granting them the requisite permission. Such certificate, he proposes, should make particular mention of the state of the lungs, and if unsatisfactory, should form the basis on which permission to form the intended alliance should be refused.

A paper on the small-pox epidemic at Düren, by Dr. Konigsfeld, gives an account of the course of the disease in 1874, and also long and careful statistical tables which show the effects of vaccination on the proportion of recoveries and deaths. From these it appears that the total number of cases of the disease was 470, of whom 255 were females and 215 males. The recoveries among the vaccinated amounted to 223 or 47½ per cent. of the whole; among the non-vaccinated 102 recovered, or 21⅝ per cent. The deaths among the vaccinated were 9⅜ per cent. of the whole; while among the unvaccinated they amounted to 21⅝ per cent. Some valuable hints as to the management of patients during the outbreak of an epidemic or in solitary cases are also given in this paper.

'The Hygienic Importance of Spring-water, with special reference to the conditions of Crefeld.' By Dr. Hœdt.

After quoting the authority of Dr. Cohn for the opinion that bacteria and other allied organisms are often the conveyers of contagion in the progress of epidemic disease among the population, the author gives an account of the presence and development of these low animal forms in putrefying substances. He also discusses their probable action when entering the blood, and shows their presence in drinking water infected by the ingress of drainage-matter, and the dangers to be apprehended from the use of such water. The greater part of the paper is taken up with the account of the author's examination and analysis of the spring water of Crefeld.

In the two following papers: 'The Louisen Hospital in Aix-la-Chapelle' (by Dr. J. Knibben), and the new London Fever Hospitals at Homerton and Stockwell (by Dr. L. Heusner), lengthy technical descriptions of the above institutions are given. Elaborate plans of the buildings are appended, but the substance of the papers is entirely descriptive, and contains no new suggestions.

'Statistics of Sickness among Railway Employés; with tables of sickness among the employés of the "Rhinish," "Bergisch-Markische," and "Saarbrück and Rhein-habe" Railways.' By Dr. Leub, Cologne.

This is a very interesting paper. The author gives a *résumé* of the results of the labours of Duchesne, Devilliers, Brisson, and Soulé, medical men attached to French railways, who first towards the middle of the present century occupied themselves with the statistics of this subject. He then publishes an elaborate table showing the percentage of sickness to effective strength among the officers of different German railways, and gives further tables which show the relations of sickness among the railway employés to the season of the year, the age, etc., and also the proportions of illness to effective strength among the different classes of railway employés, with the ratio of the duration of the days of inability to work to days of ability to work. A small table at the end of

the paper shows a striking similarity in the percentage of sickness to effective strength among the employés of the three railways. As, however, the figures are only a first attempt, and refer only to one year, the author does not see fit to draw any general conclusions from them. At the same time he gives many valuable suggestions for the collection of further figures of the same kind, which we shall hope to see carried out in a further contribution to this subject, on which the author has evidently expended much time and labour.

STAIRCASES.

VERY few houses are erected which would pass quite free from well deserved adverse criticism at the hands of an expert who happened to have made the subject of staircases his *spécialité*, and who was asked to report upon the manner in which those appliances of convenience had been arranged and carried out. We have known a house, and that not a small one, arranged and even partly built, and the question of the stairs left until the last moment—the result being a perfect cramp. Staircases designed under such silly circumstances may generally be discovered by the narrowness of the treads and the excessive height of the risers. In no good stair should the risers exceed six inches in height or the treads or 'going' between riser and riser be less than ten or eleven inches in width. When the step rises seven and a half inches, and the space for the footfall does not exceed nine inches, the height of imperfect construction has been fully reached. Even in a back stair or servants' staircase the rise should not exceed seven inches or the 'going' of the tread surface be less than nine inches and a half.

It very frequently happens that a grand staircase is completely ruined because it has been squeezed in space in order to admit a backstair behind it. This is false economy, for in such a case both stairs are imperfect and neither are commendable from any one point of view. Much better would it have been to have built but one good staircase, and constructed a lift for the hoisting up or lowering down of coals and other household impedimenta. It is objectionable, of course, to see servants laden with such matters climbing the best and only stairs; but when not necessarily burdened with such materials as we have mentioned the objection is minimised. It is better to have one good staircase than two bad ones. When room can be found for it, a backstair from basement to attic is advisable, and it would be wise in every case to contrive a back staircase so as to reach the rooms above the main reception rooms. After that, the great objection to a common stair ceases to be formidable—in other words, the presence of servants ceases, as a rule, to become a grievance.

But mistakes are not only made in choosing the whereabouts of the stairs or in the area which they are to take up. Too often the stairs are made up of a continuity of straight flights and winders, without even an apology for an occasional landing, where a halt can be made with ease. Now, if one thing is more true than another in stair-construction, it is that the rests should be frequent, and the flights as much as possible made free from winding steps. Yet it would be better to have the staircase-climb helped out with winders, than to have these and square landings interspersed; since during a hurried descent, especially in the dark, the exact position and rotation of these may be forgotten, and a dangerous fall result. A well contrived staircase will not only be free from winding steps—which frequently throw down the person nearest the radial point—but the landings will be made wide enough to accommodate a seat, and even a few statues, without any curtailment of comfort during progress upwards and downwards. The well-hole will also be made ample, so as to thoroughly ventilate the flight throughout; and if the staircase be surmounted at roof line, by a lantern light, with or without an ornamental ceiling light, so much the better. Nor should the pattern of the handrail moulding be left to chance or ignorant choice, since many good staircases are spoiled, æsthetically and otherwise, by misshapen, and overlarge or undersized hand-railings.

Staircases should never be placed in the hall, if that can possibly be helped, for in such case not only is privacy avoided, but certain facilities are furnished for thieves to reach the rooms above. They should, on the contrary, be to the right or left of the main hall, and out of sight when the front door, or even vestibule door, is thrown open. Its beauties should not be disclosed to every chance caller, but require to be duly searched for by the visitor. And speaking of beauties, the architect should be careful not to overload the ornamentation. Nothing could be a greater error than to put a palatial-looking staircase in a second-rate villa, or even a villa staircase in a cottage. In the matter of light also, as before hinted at, the ability of the designer will be easily measured. If a staircase be surmounted at ceiling line by a lantern light as an aid to ventilation, it should not the less be lighted from the outside on one wall by an upright window—or a window lengthened out so as to light each flight.

With reference to the vexed question as to the material of which the various stairs ought to be constructed, we will not venture to say much. A grand staircase in Gothic or Elizabethan mansions looks best when constructed entirely of oak, whilst in a classical type of building Portland stone would be found in every way preferable. The strength of the latter, especially where one end is tailed in the wall and the other end left free, should be made an especial matter of consideration. For backstairs wood is rather objectionable as being more likely to catch fire. If wooden stairs are adopted, the timber should be well treated with a solution of tungstate of soda, or with a saturated solution of Epsom salts. This last material has been lately recommended by a distinguished chemist. The best material for backstairs, however, is hard York stone, this substance being free from liability to calcination.

W. WOOD, a milk dealer, at 11 Grenville Street, Brunswick Square, was summoned by Hartley, sanitary inspector of milk, for selling adulterated milk.—Mr. Hartley proved the purchase of the milk and having it analysed, the result of which was that there were seventy-three parts of milk and twenty-seven parts of water.—The defendant pleaded guilty, and remarked that he could only account for the water getting into the milk by his having had it scalded to keep it during the night. When the can was put into the water he supposed that the water boiled into the milk, but that was without his knowledge.—The magistrate considered this a bad case, and it was no excuse for the defendant to say he was not aware that the milk was adulterated. He then ordered the defendant to pay 20*s.* and 2*s.* costs, or in default seven days' imprisonment.—The money was paid.

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LOANS TO LOCAL AUTHORITIES.

THE bill introduced by Sir Stafford Northcote, to regulate the borrowing arrangements of local authorities, has undergone such extensive alterations at the hands of the Government draftsman that it may almost be regarded as a new measure: at any rate, the original ground plan of the measure is now with difficulty discoverable. Under these circumstances our readers will, probably, be glad to have laid before them a new analysis of the bill.

Any local authority having power to levy a rate for public local purposes, leviable on the basis of an assessment in respect of property, may resort to the Act. It is, therefore, available to every urban and rural sanitary authority, and this notwithstanding any provision in any other Act of Parliament passed previously to the Act.

A local authority shall be deemed to borrow in manner provided by the Act, whenever it raises a loan by the issue of debentures or debenture stock or annuity certificates under the Act, or partly in one way or partly in the other, subject to the proviso, that where a particular mode is prescribed that, and no other, shall be adopted.

A debenture is to take effect as a deed, and charge the local rate or property specified therein with payment, as in the debenture mentioned, of the principal and interest therein specified. When a debenture charges property other than the local rate, and it is intended in default of payment of the principal and interest that the property is to be sold, this is to be stated. The principal sum may be made payable to bearer or to a person named and his executors, etc.

A debenture in which the principal sum is made payable to bearer is to be transferable by delivery. A debenture in which the principal sum is made payable to a person named therein and his executors, etc., is to be termed a 'nominal debenture,' and be transferable by deed. There may be attached to a debenture under the Act, or be thereafter issued in respect thereof, or partly in one way and partly in the other, coupons making the interest thereinmentioned payable to the bearer, or to the person named or his order; or the interest may be made payable to the owner of the debenture or otherwise, as mentioned therein. The debentures are not to be issued for less than the prescribed sums; where no sum is prescribed, for less than 20*l*.

A local authority duly empowered to do so may create and issue debenture stock, under regulations which are too complicated to be easily summarised.

Every annuity certificate is to take effect as a deed, and charge the local rate or property therein specified with payment, as in such certificate mentioned, of an annual sum therein specified. The provisions as to sale of property charged, as to payees, as to transfers, which are enacted in respect of debentures, are applicable almost verbatim to annuity certificates. The minimum amount of an annuity certificate is to be 3*l*.

In case of non-payment by a local authority of moneys due on securities under the Act, a remedy may be had by *mandamus* or by the appointment of a receiver.

The smallest aggregate amount whether in one sum or separate sums to authorise the appointment of a receiver is 500*l*.

All sums due or authorised to be raised on or in respect of any securities issued in respect of the same loan are to be paid without any preference. When issued in respect of several loans they are to take priority according to the dates of the loan. Moneys borrowed may, unless it is otherwise prescribed, be deemed to form one loan or several loans, as may be deemed most convenient by the borrowers, so that the aggregate amount authorised be not exceeded. The date of the commencement of each loan is to be fixed by the local authority, and may be so fixed irrespectively of the dates of the particular securities issued in respect of the loans, so however that the period within which the loan required to be discharged be not exceeded.

We must reserve till next week some account of the other provisions which will regulate the repayment of loans.

THE MEDICAL PROBLEMS OF THE DAY.

THIS is the title of an address by Nathan Allan, M.D., of Lowell, to the Massachusetts Medical Society, and the chief of the problems discussed is that of the preservation of the Anglo-Saxon race in America. It certainly is a startling fact that already the descendants of the primitive Puritan settlers in New England should be visibly and rapidly dying out; that in so comparatively recent a period of time the granddaughters, or little more, of the most prolific of women should be brought to that state of infertility that the extinction of the race is gravely threatened. Such, however, is the fact; and the birth-rate of Massachusetts tells that the New Englanders are a doomed people if there be any truth at all in Mr. Darwin's famous axiom that 'barrenness is the precursor of extinction.' The American physicians have watched with eager interest this modification of type in the New England mother, and have raised their warning voice again and again in fervid utterances. We are too much inclined, here at least, to ascribe this diminution of

the birth-rate to certain practices in vogue amongst American women, by which their family is limited. That there may be some truth in this allegation Dr. Allan admits, but he says, 'other causes also exist in the peculiarities and changes in physical organisation.' That such is the case is evidenced by the sterility of native American women in the Eastern States in comparison with the fertility of Irish, Germans, Scotch, English, and French Canadian settlers among them; and in some towns the birth-rate does not equal the death-rate. Only three hundred years ago a family of over twenty children, all of whom attained adult life, was quite a common event in that very area where the death-rate has overtaken the birth-rate. It is even still more startling to find a man of Dr. Allan's sagacity and clinical experience endorsing what has been said by Fourier, Greg, and others, that it is brain development, the cultivation of the intellect, which is the chief factor in the production of barrenness. Strange indeed it is that that very education on which New England has so prided itself, and of which it has boasted so much, should seem to lead its people to extinction. The education of the girls seems to have been especially fraught with evil. Now, when the higher education of woman is being so much discussed, such statement is most important. If the education of girls militates so distinctly against their qualification for the duties of motherhood, we are driven to the disagreeable conclusion that we must choose betwixt an accomplished and highly educated but barren bride, and a less intellectual but fertile spouse. As an intellectual companion for man, the present American woman is all that can be desired, but no children will play about the hearth, nor cheer the declining years of the infertile couple.

Dr. Allan says, 'Their style of living taxes the brain altogether too much; it develops a great predominance of the nervous temperament at the sacrifice of other parts of the body, which, by inheritance, is increased from generation to generation. The balance of structure and harmony of function in organisation is radically changed, and carried to an intense development of nervous tissue, which, in its very nature, is unfavourable to the procreation of offspring.' This excessive development of the nervous system, so much in vogue now, is in direct antagonism to the development of the organs of nutrition. Even when they are mothers, in many cases American women simply cannot suckle their infants; they are unfit for, and incapable of, one half at least of the functions of motherhood. That physical organisation which is so absolutely necessary for the would-be mother, is awanting or undeveloped. 'The proportion of American mothers that have an abundance of good milk, and can thus support the child well till the time of weaning, is not large.' The fine physique of the women of the Mayflower has passed steadily into the development of a thin, acute, intellectual creature, possessing few of the characteristics of the mother. A radical change has been brought about. 'The brain and nervous system have, for a long time, made relatively too large a demand on the organs of digestion and assimilation, while the exercise and development of certain other tissues in the body have been sadly neglected; or, in other words, there is a marked deficiency in the organs of lactation, nutrition and secretion.' If, then, an advancing civilisation and a high intellectual culture of women are detrimental to the prospects of future generations; if, in America for instance, fertility hangs chiefly around an encroaching vanguard of civilisation, and the older and cultured districts cease to become prolific; the followers of Malthus need not be so profoundly afraid of an ultimate excessive population; there seems more ground for the apprehension, that the cultivated people will die out over the favoured portions of the globe, and that the survival of lower races, not developed intellectually at the expense of their reproductive capacity, will alone prevent the earth from ultimate desolation;—from the removal of man from the earth he was the last to enter upon, and of which he is apparently the natural tenant.

Notes of the Week.

PREVENTION OF DISEASE.

THE following remarks, made by Dr. Morgan at the Manchester and Salford Sanitary Association, deserve serious attention. He said that if there was one direction in which the study of medicine had made greater progress than another during the last ten or fifteen years, it was in the way of the prevention of disease. If we understood better the way in which diseases were spread we should be better able to meet them. At the beginning of the present century five out of every six of our population lived in country districts, but now circumstances were changed, and three out of every four of the population were dwellers in towns. We must therefore take care that the people in our towns enjoyed as perfect health as it was possible to give them, and he believed the most important measure which it was possible for any government in this country to undertake would be to pull down and rebuild the uninhabitable portions of our large cities. If this were done we could look forward to the future with very much more satisfaction than we can at the present time. That seemed to him to be what was essentially wanted, because a great number of persons might be healthily lodged in close proximity if they were judiciously packed, as was proved by the health of the occupants of the dwellings erected in London by the Peabody trustees. But in what he called the uninhabited portions of our cities they were not judiciously packed; they were huddled together in houses which were never intended to hold them. He advocated the erection of dwellings for the poor with shops on the ground floor, as the upper stories he believed to be much healthier than the lower ones. On the ground floor they had to contend with smoke above and sewage beneath, but with the higher stories they had only to contend with the smoke. Besides that, he believed that the germs of disease did not rise to any great height from the ground, and it had been found in countries where malaria exists, that people on the ground floor had suffered from it, whilst those in the higher parts of the house escaped.

THE DUBLIN MAIN DRAINAGE.

THE Government have made a reasonable, or more properly, a handsome proposal, to the Dublin Corporation with reference to the main drainage of the city. The Dublin Corporation have asked the Treasury for support for a bill to increase their borrowing powers. The Government having some doubts about the solvency of the Dublin Corporation, have required that it shall be represented on the Dublin Main Drainage Committee. This, after much objecting and disputation, the corporation has agreed to. We think the Government are taking a very wrong course in permitting any compromise in this matter. The Main Drainage Committee have, up to the present, failed in every attempt to carry out any main drainage scheme, and it being quite evident that the body is incompetent, we think it is the duty of the Government to supersede the authority as at present constituted. A body which some few years ago agreed that the proposed works could not be carried out for less than 900,000*l.*, and now considers that the same works can be accomplished for 450,000*l.* or 500,000*l.*, is suspiciously ignorant of its duty, or else worse than ignorant. Either the works cannot be properly constructed for less than 900,000*l.* and the present plan is inefficient, or else the works could have been done for 450,000*l.*, as at present proposed, and the former proposal was a gigantic swindle. We are not sufficiently informed as to details to be able to decide which alternative is the correct one; but we leave the dilemma to be solved by the Dublin Corporation.

THE RATE OF MORTALITY DURING LAST SPRING.

THE long and trying winter of 1874-5 will be remembered not only for its unpleasantness, but also for its exceptional fatality, especially among elderly people. The number of premature deaths caused by its severity can never be accurately known. The hard facts published by the Registrar General in his quarterly return, however, conclusively show that a comparatively large excess of deaths was caused in each of the three quarters ending December, March, and June last. An examination of the figures in these returns shows, moreover, that the excess in each of these quarters was principally due to the deaths of infants and elderly persons referred to diseases of the respiratory organs. In the Registrar General's quarterly return relating to the second or spring quarter of the year, the annual rate of mortality was equal to 21·9 per 1,000, which not only exceeded the average rate in the corresponding quarter of the ten preceding years, but was higher than in the spring quarter of any year since 1866. The Registrar General, in pointing out that this excessive death-rate was almost entirely confined to infants and elderly persons, attributes it principally to the fatality of diseases of the respiratory organs, caused by the severity of the past winter, and the exceptionally severe alternations of temperature during April. We shall probably again have reason to refer to the figures contained in the quarterly return which has just been published relating to the three months ending June; it will be sufficient, therefore, now to record the fact that the return, in showing a decline in the death-rate from zymotic disease, more especially from typhus and enteric fever, bears satisfactory evidence of an improvement in the sanitary condition of the population of this country, due in great measure to increased sanitary activity in our larger towns.

THE CHESTERFIELD WATER-SUPPLY.

ARRANGEMENTS are in progress for the supply of water to the inhabitants of Dronfield and Unstone from Chesterfield. This fact gives additional value to the analysis of three samples of the Chesterfield water-supply which have recently been made by Mr. A. H. Allen, F.C.S., lecturer on chemistry at the Sheffield School of Medicine, and public analyst for the borough of Sheffield. The three samples were taken respectively from the source of supply, from the town tap previously to the water being turned on at the works, and from the same tap half an hour after the water had been turned on. Mr. Bluett, the medical officer of the borough, in submitting Mr. Allen's report to the Town Council, expressed an opinion that the Chesterfield water-supply is superior in quality to that of nine out of every ten towns in the kingdom. All three samples were found to be 'fairly pure, and of very moderate hardness.' One important feature of this analysis was that the sample drawn from the town tap previously to the water being turned on at the works, contained ·10 of a grain of albuminoid ammonia per gallon, whereas the other two samples only contained ·05 and ·02 of a grain respectively. This evidence is important in its bearing upon the dangers arising from an intermittent supply. The Chesterfield water is evidently in the best condition when just delivered from fully charged mains; and in this respect the Chesterfield water is probably not exceptional; the manner in which the samples were taken, and the result of their analysis, should materially strengthen the hands of those who are urging the universal adoption of the constant supply system.

THE SANITARY CONDITION OF FLEETWOOD.

IT is not long since the town of Fleetwood, in Lancashire, suffered from the fatal prevalence of scarlet fever, and yet it appears that little has yet been done to improve the sewerage, or to prevent the occupation of cellar-dwellings, although both these subjects have been continually referred to by the medical officer of health in his reports to the local board, which constitutes the urban sanitary authority of Fleetwood. At a recent meeting of the local board a discussion took place with reference to the drainage shortcomings of this town, the result of which did not afford satisfactory evidence of its sanitary prospects. The discussion arose upon a notice of motion which had been placed upon the agenda-paper to the effect that a back drain should be laid for the use of the houses in Dock Street. It was stated that sewage water stood in pools in the yards and at the back of these houses, and in the course of the discussion it was also mentioned that the same dangerous condition existed in other streets of the town, for which necessary drains had been ordered but had not been executed. A drainage system has been long talked of in Fleetwood, and it is understood that some plans are in course of preparation; this was made the plea for passing, some time since, a general order of the local board to the effect that drains which were wanted for certain houses should be left in abeyance until these plans were completed. On this ground it was contended by several members that the board would not be justified in laying drains to private houses, and the motion for the special drain to reduce the serious nuisance at the back of Dock Street was lost. The medical officer of health reports that the health of the town remains satisfactory, but how long it may remain so, with its back streets abounding in pools of sewage water, it is impossible to calculate. This is the kind of sanitary apathy which breeds epidemics.

FEVER IN DRAINS AND SEWERS.

ONCE more public attention has been drawn to the necessity of making certain that our town sewers are adequately ventilated, and that our houses are cut off from any direct connection with these dangerous underground conduits. It is the duty of town councils and the heads of all other public bodies to discover whether the sewers are properly ventilated, either by openings in the crown of the sewer at intervals of about three hundred feet apart, or by properly built shafts. It is none the less incumbent upon all health committees and town surveyors to ascertain whether or not the house-drains are severed from the sewers, either by ventilation afforded by shafts rising up to the house-top from the heads of the house-drains, or by a delivery of the

wastes of the house over some disconnecting trap. And if these wise precautions are not taken by them, then the inhabitants should agitate, and agitate until they are taken.

At the present moment Bristol is threatened with an eruption of typhoid fever, which may any day break out during the passage through her sewers of effete matters, fever of an alarming type having obtained a considerable hold of the Ashley Down Orphanage by means of a polluted watercourse. The medical officer for Bristol is even having the whole of the main drains leading to the north side of the town saturated with sulphate of iron and other disinfectants. But disinfectants will not altogether prevent an outbreak, and, therefore, no time should be lost in diluting the sewer air at some safe spot, and labouring after an immunity of attack in this way.

It is sad to think that in fifteen cases out of twenty, if not more often than this, people are only awakened out of their apathy in sanitary matters by the actual presence of the destroyer. They forget that the proper time to examine the hygiene of a town or a residence is when they can go into the whole minutiæ of the matter with absolute safety, nor fear the thorough exploitation of sewer, drain, cesspool, gully, or trap. When the pythogenic poisons are riding the air of these places is not the time to secure a proper report or to estimate exactly what ought to be done for the future. Sanitary science has now become emancipated from her rule-of-thumb days, and if only her principles are adhered to, it will be found that she can teach them independent of the pressure of knowledge brought about by the invasion of diseases. It will also be more economical to sit at her feet occasionally. Only consider what the extra surveillance, the disinfecting materials, and the additional labour costs, even on the occasion of an outbreak in one small town.

IMPROVEMENT OF HEALTH OF LONDON.

A WRITER who has been accustomed to deal with the promotion of health in colonial towns offers the following suggestions: 'The number of greens, commons and parks at once strikes the stranger as wonderful in so dense a city, especially as they are full of pretty flowers and bright grass. The newly-opened garden in the heart of London in Leicester Square is an example, as are also Camberwell Green, Kennington Park, and Clapham Common, which afford good lungs to the town. If there is one topic more than another which colonial editors are ever hammering on, it is to provide similarity. The medical doctors with whom the writer has been familiar in different parts of the world have been very earnest in a like approval. But besides taking advantage of these glades for pleasure, the people would do well to secure their residence as near them as possible. Every one knows how subject most cities are to scourges like typhoid fever, small-pox, and cholera, and there is no doubt that London is magnificently and generously found in hospitals of every kind; but there is always a considerable percentage of persons languishing and passing away in disease, not properly cared for, in lonely lodgings, or in utter poverty, to remedy which until better arrangements are found, the clergy, doctors, and police should endeavour, so far as possible, to discover and report on. Parochial officers and inspectors of nuisances must be strictly kept to their duty. It is a fact that new and improved arrangements are not sufficiently made on a knowledge of all that transpires in the various districts collectively. An article published nearly two years ago, *à propos* to typhoid, recommended the establishment of a medical observatory, with properly scientific officers, to study the meaning of disease in London and to anticipate the epidemics. The poorer classes sometimes become ill through eating coarse pieces of meat from the butchers' shops, such as bullock's liver, etc. Australian meat is recommended. It is, strange to say, little known amongst such classes as yet, and so far from being unpalatable, is generally most relishing; but the tins must be bought at reliable shops. Want of cleanliness and tolerance of vermin is, to my great surprise, quite a feature in many of the classes of London life. Indeed, in higher ranks than could be generally supposed, this feeling has much increased within the past ten years; but it is difficult to know to what it is attributable. Some of it would come probably from the increased extravagance of living and taste for dissipation. It is distressing to note the crowds of well-dressed young women in the streets, whose faces exhibit egregious traces of fleas, and worse. It is not the ordinary black flea, which pervades hundreds of respectable looking lodging-houses, but a large one resembling a combination of an ant, with a small chrysalis, a very disgusting one, which destroys the hair. A most serious caution should be given, not only to London, but to the whole English people, to pay greater attention to cleanliness. It is a fact that there is scarcely a country public-house in the highways and byways between here and Northumberland not filled with vermin of some kind. Lodgings in the towns for persons of the soldier rank are nearly as bad.'

CALCULATION OF DEATH-RATES.

A CORRESPONDENT at Sheffield appears to have experienced a difficulty in comprehending the manner in which the Registrar General calculates the death-rates which are published in his periodical reports, more especially in his weekly and quarterly returns. The usefulness of these returns depends in some measure upon their being easily comprehended, and upon the confidence with which they are accepted by the public; and as our correspondent may not be alone in his doubt as to the method adopted for the calculation of these published rates of mortality, it may be well briefly to describe it.

In the first place, it is scarcely necessary to say that all the rates now published by the Registrar General, whether they relate to a year, a month, or a week, are annual rates to 1,000 persons living; that is, these published rates represent the number of persons who would die in a year, in 1,000 of each population, if the proportion of deaths to population recorded in the shorter periods of a week, or a month, or a quarter, were maintained throughout a whole year.

Let us take a rate of mortality from the Registrar General's last weekly return relating to the seven days ending July 31 as an example. We find in Tables 1 and 2 of that return it is stated that the estimated population of the borough of Sheffield in the middle of 1875 is 267,881 persons; that 127 deaths were recorded within the borough during the week under notice; and further, that these deaths were equal to an annual rate of 24·7 per 1,000 of this estimated population. Now for the operation by which this result is arrived at. We have the deaths in a week, and the estimated population in which they occurred; it is desired to find the number of the deaths which would occur in each 1,000 of this population, if the same number of deaths were recorded in each week throughout a year. If a week were the correct fifty-second part of a year, it is obvious that either the deaths must be multiplied by fifty-two or the population be divided by fifty-two, in order to make the population and the deaths comparable. As, however, the correct number of days in a natural year is 365·24226, the number of weeks in a year is 52·17747. The Registrar General, therefore, for the purpose of this weekly return divides the estimated population of each of the towns dealt with by 52·17747, which gives what may be called the weekly population of each town. The population of Sheffield divided by 52·17747 gives a weekly population of 5,134 persons; this number serves as constant throughout the year 1875, by which to divide the number of deaths. The 127 deaths in Sheffield during the week ending July 31, divided by this so-called weekly population gives an annual rate of 0·0247 to each person of the population; and by removing the decimal point three places to the right, or in other words multiplying by 1,000, we arrive at 24·7, which is the correct annual rate of mortality per 1,000 of the estimated population of the borough of Sheffield during that week. It would, undoubtedly, be more logi-

cal to multiply the deaths by 52·17747, than to deal with the population; but this operation would have to be repeated each week, whereas there is a manifest convenience, and an arithmetical economy, in the reverse operation (the effect of which is, of course, identical) which supplies us with a constant that is applicable throughout the fifty-two weeks of 1875. For all practical purposes the multiplication of the deaths in a week by fifty-two, in order to divide them by the estimated population, will afford the means of arriving at an approximately correct annual rate of mortality; or the reverse operation, the division of the population by fifty-two may be resorted to.

For the calculation of annual rates of mortality in a month or a quarter, the Registrar General takes account of the number of days in each month or quarter, and it is found more convenient to deal with the population according to the method described in the calculation of the annual rate of mortality in a week. The populations to be dealt with are divided by 365·24226, and must then be multiplied by the number of days in a month or a quarter, in order to arrive at the population which may be applied to the deaths in a month or a quarter; by this means a scientifically correct annual death-rate in those respective periods will be obtained. Approximately correct annual rates of mortality in a month or a quarter may be calculated by using a twelfth or a quarter of the population respectively, as the divisor of the number of deaths recorded in those periods; but, inasmuch as the length of a month varies from twenty-eight to thirty-one days, and of a quarter, from ninety to ninety-two days, it is evident that a correct annual rate of mortality can only be calculated by taking into account this variation in the number of days in those periods, and that rates calculated without correction for these inequalities will differ from the rates published by the Registrar General.

In conclusion, it may be noted that rates published in the quarterly returns of the Registrar General for the eighteen largest English towns relate to the period of thirteen weeks, most nearly corresponding with the natural quarter, and that the population employed in this calculation is thirteen times that used for the rates in each week, and differs slightly from the population that would be used if the period of observation were three entire calendar months instead of thirteen weeks. The facts published in the quarterly return for all other parts of the country, except the eighteen largest English towns, relate to the natural quarters of three calendar months, and the population used to produce the annual rates of mortality therein are manipulated in the manner before described.

Special Report.

THE OUTBREAK OF ENTERIC FEVER AT MÜLLER'S ORPHAN ASYLUM.

By DAVID DAVIES, Medical Officer of Health for Bristol.

THIS most excellent charity for the support and education of orphans who have lost both parents, consists of five separated and isolated wings, generally called houses, adapted for the reception of 2,000 orphans, and is supported entirely by voluntary contributions without the aid of a committee or canvassers. It was originated by the most extraordinary man of the present day, the Rev. George Müller, who is still the active superintendent of this gigantic charity. The only means which Mr. Müller uses for replenishing his coffers when getting low is (as given in his published narratives) 'prayer.' However others may differ in theory with this great and good man, it must be acknowledged that his results are transcendent, and in the opinion of the writer George Müller's 2,000 orphans as they occasionally walk through the streets of Bristol, well fed, well clothed, and well cared for, present a stronger argument in favour of religious belief than whole volumes of disquisitions on 'the evidences.'

All the houses are well drained, well ventilated, and kept scrupulously clean. The house drains discharge into a main sewer, recently made and connected with one of the systems of sewers of the city of Bristol.

The inmates are attended by, as I am made to understand, two resident medical officers and a consulting physician, resident in Bristol. The medical officers are believers in homœopathy, and conduct their practice in the establishment on this system.

Rumours of the prevalence of fever in the house had for some weeks been prevalent; but as no intimation of this had been sent to me by the medical officers, and as no deaths from fever at the Asylum had been returned to me on the weekly official returns of the local registrar, I did not think it my duty to intrude, especially as the medical treatment followed at the institution is, according to my honest belief, based on a baneful superstition. On Monday the 26th ultimo five deaths from fever and one from hæmorrhage at the Orphan Asylum appeared on the local registrar's weekly return to me (the one recorded as hæmorrhage proved on inquiry to have been a case of fever). I then considered it my duty to make an official inquiry. On Tuesday, the 27th ultimo, I called at the Asylum and was received with every courtesy and kindness. I found the disease had prevailed for five or six weeks in No. 2 and No. 5 houses. A large number were then ill of the disease. I was admitted into two sick wards and was allowed to examine the patients. I found the disease to be a very severe form of enteric fever, accompanied by great prostration, and, in many cases, with 'tympanitis.' It appears by a letter from one of the medical officers in the local papers that 500 have suffered from this fever since June 24 last, and that twelve have died. As five of these have only appeared on the local registrar's return to me this morning of last week's mortality, it is certainly too early to count results.

I was informed that at the outbreak of the epidemic thirty sickened nearly simultaneously, and that the cases were severe; from this I formed an opinion founded on my friend Dr. William Budd's views and my own experience, that the poison had been introduced by means of water, and had afterwards spread in the establishment by the non-adoption of sufficiently stringent means of prevention; but there was this difficulty, Mr. Stoddart, our able city analyst, had recently pronounced the water of the establishment, drawn from wells on the establishment, to be good and pure. The milk was eliminated from the inquiry by the fact that the same milk was used in the other houses not affected with fever. It is true we found several of the sink traps (locally called ejects) communicating with the main sewer defective, but they were equally defective, if not more so, in the unaffected houses. On Thursday, the 29th instant, I again visited the Asylum, and ascertained that several of the children first affected had been habitually taken for their regular walks through a very pretty and picturesque dingle close to the Asylum; at the bottom of this dingle runs a stream, fed by open ditches containing the sewage of houses on Ashley Down. I examined these ditches on the same day and found them saturated with sewage. Enteric fever has recently prevailed in houses on Ashley Down. I have ascertained from two of the governesses that the children had been allowed to drink water from this stream or other sources in its immediate vicinity. Several interesting little girls showed us how they did so by putting the palms of their hands together and raising them to their mouths. I now considered the evidence as to the origin of the disease complete. The disease did not originate in the establishment but outside; but having broken out, it certainly ought to have been stopped at an early period, as our knowledge of the mode of propagation of this fever and the means at our command enable us to do so without fail.

I will not go into the details of the means now adopted. The ejects of the house are all rectified and rendered doubly secure. The dejecta of the sick patients are disin-

fected and not thrown into closets frequented by the healthy. The governesses have been directed to avoid the picturesque dingle, and not to drink from unknown streams. All the closets are flushed twice a day and disinfected once, not with small quantities of disinfectants, but with sufficient to produce visible effect on the contents of the main sewer. The rural authority, through whose district the polluted stream in the dingle runs, have received an urgent report on the subject from their medical officer. About this there is a great difficulty. The water-shed lies above, and empties its contents through that of Bristol. The Bristol sewers are not adapted, except for the sewerage of the Parliamentary borough. This is a difficulty which is becoming more apparent every day; this polluted little stream, carrying the seeds of disease and death in it as well as most of the sewage of Shapleton, is now discharged into the river, from which it runs into the floating harbour of Bristol.

I have written this at the request of the editor of the SANITARY RECORD, with an earnest desire to say nothing that can possibly injure the sacred cause of the parentless children. My only report on the subject was my official weekly one to the sanitary committee of the Bristol sanitary authority, which I was in duty bound to make. The representatives of the Press being now admitted to the meetings of that committee, I had no option regarding publication. If I had, I confess I should have shrunk from it, for fear of injuring this sacred charity.

Report.

ON THE CAUSE AND PREVENTION OF TYPHOID FEVER IN SCHOOLS.

IN a recent number of the *Philadelphia Medical Times*, John L. Leconte, M.D., gives an account of an inspection of St. Mary's Hall, Burlington, New Jersey, in order to ascertain the cause of an outbreak of typhoid disease which had occurred some weeks before.

The cause, as is usual in such cases, was easily discovered.

At the time that the hall was built the water-supply was obtained from two cisterns, constructed of heavy wooden curbs, lined with brick and coated with cement. They were floored with timber, and descended below the level of subterranean drainage, by which spring-water would enter. In order to place the floor properly a hole was cut in each to prevent the pressure of the spring-water. After the timber floor was fixed permanently these holes were plugged, the plugs rising above the masonry bottom of the cistern. The water-supply was thus made to depend entirely upon the river; and had these arrangements continued without change I am confident that no typhoid disease would have occurred.

A year later, without the knowledge of the authorities of the school, the plugs at the bottom of the cisterns were removed. This was a capital error, but would, perhaps, have been insignificant in its results had it not been supplemented by a second, the pernicious effects of which recently manifested themselves. A year or eighteen months afterwards (1871), privy-vaults were dug outside of the building for the reception of the excreta, which up to that time were received in boxes and removed every few days.

One of these privy-vaults was most inconsiderately placed about eight or twelve feet from the water-cisterns, which, as is mentioned above, had been opened to the influence of subterranean drainage. This privy-vault seems to have been constructed with all the care usually exercised in the building of such receptacles—bottom and sides nine-inch brick, laid in cement, heavily and carefully covered with cement, and arched over above.

The result was naturally what any student of sanitary science would have predicted. After a certain lapse of time (in this instance three years) the soil around the privy-vault became poisoned with the effluvia and infiltrations, and the water-supply in the cisterns thus became contaminated.

Having thus ascertained the cause of the disease, the remedy was, of course, evident, and of easy application. I was glad to find that it had been already recommended by the physicians of the establishments, Drs. Pugh and Gauntt, who, with admirable judgment, had, on December 18, 1874, advised the disuse of the cisterns. It is a significant fact, as showing the correctness of my view, that the contiguity of the privy-vault to the cisterns was the sole cause of the disease; that ten days after the water had been, by the advice of the physicians, drawn directly from the river, the last case of typhoid fever occurred, and since that time (December 28) the school has been quite free from all similar disease.

One or two interesting facts were developed during my examination, which are worthy of mention. Although numerous cases of typhoid occurred among the girls, and a smaller proportion among the teachers, not a single one of the servants was affected. On inquiring of the latter whether they drank water, the reply was that they used only tea and coffee, and almost never drank between meals. The girls, on the contrary, like all children, are frequently thirsty, and drink often at intermediate hours of the day. The water consumed by the servants was, therefore, boiled, by which process the molecular activity of the putrescent matter was checked, and its power as a zymos was destroyed. No more admirable instance of the efficacy of this simple remedy for the purification of contaminated water can be found.

I asked the Rev. E. K. Smith, D.D., the principal of the school, what had been the fate of those pupils who did not use tea, coffee, or milk, but drank water exclusively. He told me that, after careful inquiry at the different tables in the refectory, he ascertained that of seven absolute water-drinkers six had been attacked with typhoid.

In conclusion, I would invite the attention of my colleagues in the medical profession, and the governing authorities of schools, both public and private, to the ease with which all similar outbreaks of disease may be prevented, or, as in the present instance, speedily removed, by seeking scientific advice.

The following recommendations, if adopted, would in most cases prove effective:

1. Before the plans of the building are fully matured, let an expert in sanitary studies be employed to give directions to the architect in all that relates to ventilation, drainage, and water-supply.

2. After the building is completed no alterations should be made affecting these three essentials of good hygienic condition, without the suggestion of a practised sanitarian.

3. There should be stated inspections, say twice a-year, of each institution by some sanitarian of acknowledged merit, who, after close examination and the correction of any defect, would give a certificate to be published in the circular or announcement of the school.

4. On the outbreak of any zymotic disease in the institution the advice of a sanitarian expert should at once be obtained, in order that means may be taken for its restriction, suppression, and prevention.

The Health of Watering Places.

VIII. EASTBOURNE.

THERE are few English watering-places that have in recent years risen more rapidly in the estimation of the public than Eastbourne, if rapid growth and increase of population may be accepted as evidence of such an assertion. The local board district of Eastbourne is co-exten-

sive with the parish of that name. The census enumerations show that the population of the parish of Eastbourne increased from 1,668 in 1801 to 3,433 in 1851; it rather more than doubled in those fifty years. Between 1851 and 1861 this population further increased to 5,796, equal to 68·8 per cent. in the ten years; and in the last decade 1861–71 it further rose to 10,361, the increase being 78·8 per cent. The annual rate of increase between the last two censuses was, as nearly as possible six per cent., and assuming that this rate has been maintained since 1871, the resident population of the parish and local board district of Eastbourne may now be estimated at 13,236 persons in the middle of this year.

The parish of Eastbourne forms, however, only part of the registration sub-district of Eastbourne, which also contains the parish of Seaford, and the six rural parishes of East Dean, Friston, West Dean, Littlington, Lullington, and Alfriston. The 12,977 persons enumerated in Eastbourne sub-district in 1871 included, in addition to the 10,361 persons in Eastbourne parish, 1,357 in Seaford parish, and 1,259 in the six rural parishes.

In the Registrar General's Watering-place Table the entire sub-district is taken to represent Eastbourne as a watering-place, and the merging of the facts relating to this population of rather more than two-and-a-half thousand persons living in Seaford and the six rural parishes, with those for Eastbourne proper, to some extent favourably affects the rates published for this watering-place. This effect, however, as in other similar cases previously examined, is so slight as scarcely to detract from the value of the Registrar General's figures for the purpose of estimating the sanitary condition of the watering place. For instance, in the year 1874 the death-rate in the entire sub-district of Eastbourne was equal to 15·7 per thousand, whereas in the parish of Eastbourne it was 15·8, in Seaford 13·8, and in the six rural parishes 15·0. It should be stated that these rates are uncorrected for deaths in institutions, of which we shall have more to say presently.

Before proceeding to discuss the details of the mortality in Eastbourne, it will be useful briefly to consider the birth-rate, principally with the view of throwing some light upon the probable trustworthiness of the estimated population of this watering-place at the present time; because upon the approximate accuracy of the population number, which is used as the basis of nearly all vital statistics, the value of such statistics entirely depends. During the ten years 1861–70 the average annual birth-rate in the registration sub-district of Eastbourne was 29·9 per 1,000. In the four years 1871–4 the birth-rate calculated upon the estimated population has been successively 28·2, 31·4, 28·1, and 30·8, showing an average for the four years which differs but slightly from the average rate in the ten years 1861–70. So far, therefore, as may be judged from this consideration of the birth-rate it may be assumed that the estimate of the present population of Eastbourne is sufficiently near the actual number to be used as the basis for the calculation of reliable results. It appears probable that the high rate of increase of population which prevailed in Eastbourne between 1861 and 1871 has been maintained since 1871.

There are no available means for ascertaining the rate of mortality in Eastbourne parish during a series of recent years, but the publications of the Registrar General afford the materials for calculating the rate of mortality in the sub-district, which do not, as we have shown, differ considerably from the figures for the parish or local board district. The annual rate of mortality in the sub-district during the ten years 1861–70 averaged 17·0 per 1,000, and in the four past years of the current decade 1871–4 the death-rate has been successively 15·8, 14·0, 16·3, and 15·7. Thus in the four past years the death-rate has averaged but 15·5 per 1,000, and has been 1·5 per 1,000 lower than the average rate in the preceding ten years. These rates, moreover, low as they are, are slightly over-stated, inasmuch as the sub-district of Eastbourne contains not only the union workhouse, but two convalescent hospitals situated respectively at Eastbourne and Seaford. During 1874, for instance, ten deaths were recorded in the union workhouse, and four in the All Saints convalescent hospital at Eastbourne; a sixth of the deaths in the workhouse, and all those in the convalescent hospital may be assumed to have been of inmates admitted to those institutions from outside the area of the sub-district, and may therefore be fairly excluded from the calculation of the year's death-rate in the sub-district. With this correction, that is, the exclusion of six institution deaths, the death-rate in Eastbourne sub-district in 1874 is reduced from 15·7 to 15·3 per 1,000.

In analysing the mortality statistics of Eastbourne for 1874 we shall confine our attention to the deaths registered within the parish and local board district of Eastbourne during the year, namely 198, of which six were probably of inmates of the workhouse and convalescent hospital who had been admitted from without the parish. After correction for these institution-deaths, the death-rate in the parish is identical with that in the entire sub-district, namely 15·3 per 1,000. During the year the deaths in the parish included three which were referred to measles, two to fever, two to whooping-cough, three to diarrhœa, one to small-pox, and not one either to scarlatina or diphtheria; in all, eleven deaths resulted from these seven principal diseases of the zymotic class, showing a proportion of 5·6 per cent. of the deaths from all causes, and a rate of 0·9 per 1,000 persons estimated to be living. The percentage to total deaths of those referred to the principal zymotic diseases during 1874, in the watering places previously noticed, ranged from 10 in Ramsgate and 11 in Deal and Walmer, to 18 in Lowestoft and 29 in Yarmouth. The two deaths referred to fever in Eastbourne during 1874, were one of gastric fever in the Grand Parade, and one of enteric fever in Seaside. Perhaps the most remarkable feature connected with the zymotic death-rate in Eastbourne in 1874 is the complete immunity from diarrhœa which the parish enjoyed during the third or summer quarter of the year, whereas in the seven watering places previously discussed the annual death-rate from this disease during that period ranged from 1·2 per 1,000 in Hastings, to 4·9 in Margate. Only three deaths in Eastbourne were referred to diarrhœa during the year, two of persons aged upwards of eighty years in the June and December quarters, and one of an infant in the December quarter. This remarkable immunity from the fatality of diarrhœa among the infants at Eastbourne in 1874, does not appear to be entirely unprecedented, as only four deaths were referred to the disease in 1873 in the entire registration district of Eastbourne, which is a still larger area than the sub-district which has been previously referred to. It would be interesting and useful to ascertain if possible whether this remarkably small mortality from diarrhœa, which is essentially an infantile disease (as 82 per cent. of the deaths referred to it during the summer are of infants under one year of age), is due to any peculiarity of the climate of Eastbourne, or whether it may be taken as evidence of constitutional vigour in the infantile population, and of satisfactory sanitary conditions under which they exist in this watering place.

In order to afford the means for further considering this interesting problem, it will be well to examine the rate of infant mortality from all causes in Eastbourne during 1874. The deaths of infants under one year of age registered within the parish during the year were 57, and showed a proportion of 152 per 1,000 of the 376 births registered in the parish during the same period. This proportion of infant mortality in seven other English watering places ranged from 113 and 126 in Ramsgate and Dover, to 154 and 158 in Yarmouth and Lowestoft. Notwithstanding the low rate of mortality among infants resulting from diarrhœa, the rate from all causes was high, which is the more remarkable when the low death-rate at all ages in Eastbourne is remembered. The fifty-seven deaths of infants under one year of age included fifteen each in the first two quarters of the year, and sixteen and ten respectively in the quarters ending September and December. With regard to the causes of these fifty-seven deaths, five

were referred to zymotic diseases, eight to hydrocephalus and scrofula, four to cephalitis, seven to bronchitis, five to diseases of the digestive organs, three to malformations, eleven to premature birth, and eleven to the somewhat indefinite causes of convulsions, atrophy and debility, and want of breast milk. The proportion of deaths of infants referred to premature birth was remarkably high in Eastbourne last year.

The enumerated population of Eastbourne in 1871 contained a proportion of 6·9 per cent. of persons aged upwards of sixty years; this proportion was lower than that which prevailed in 1871 in most of the other English watering places which have been discussed, which is probably due to the rapid increase of the population, principally caused by immigration. Assuming that the proportion of persons aged upwards of sixty years in the Eastbourne population is the same now as in 1871, the number of persons living in the parish at these ages in the middle of 1874 was 865; the fifty-eight deaths of persons aged upwards of sixty years were therefore equal to a rate of 67·1 per 1,000, against 72·0 in the whole of England and Wales during the year. In the six other watering places previously mentioned, the death-rate among persons aged upwards of sixty years in 1874 ranged from 56·6 in Lowestoft to 65·1 in Yarmouth. It is not easy to discover the reason for this comparatively high death-rate among elderly persons in Eastbourne; can it be that the climate is too bracing for persons in advanced years? The severity of the cold during November and December last would probably be more fatal to elderly people in Eastbourne than in other watering places on the south coast, having a different aspect.

Before concluding this analysis of the Eastbourne mortality in 1874, it will not be out of place briefly to notice the proportion of deaths referred to diseases of the respiratory organs. The deaths referred to these diseases and to phthisis in 1874 were fifty-four, and equal to a rate of 4·3 per 1,000 persons living in the parish; in London the rate from these diseases was 7·2 per 1,000, whereas in Dover and Lowestoft it was, as we have recently shown, 5·4 and 3·8 per 1,000 respectively. The death-rate in Eastbourne last year from diseases of the respiratory organs, including bronchitis, pneumonia, asthma, pleurisy, etc., was 2·6 per 1,000, against 2·4 and 3·6 in Lowestoft and Dover. The phthisis rate in Eastbourne was 1·8 in 1874, against 1·3 and 1·8 per 1,000 in Lowestoft and Dover. The death-rate from these diseases in watering places is to some extent disturbed by the deaths of visitors; but we are not aware that either Dover, Lowestoft, or Eastbourne are recommended as resorts for phthisical patients; and few patients suffering from bronchitis or pneumonia, except when convalescent, would be advised to migrate to watering places. The above figures may, therefore, pretty fairly represent the proportional fatality in these three watering places from these diseases among their respective resident populations.

A few words will be desirable upon the evidence to be derived from the mortality returns of Eastbourne during the first half of this year as to the recent health of the town. For this purpose we must be contented with the figures for the entire sub-district, which, however, do not materially differ from those for the parish. During the first quarter of this year the sixty-eight deaths in Eastbourne sub-district were equal to an annual rate of 17·5, and in the three months ending June the same number of deaths were registered, giving a rate of 17·3 per 1,000. These rates, although low, showed an increase upon those which prevailed during 1874. The increase was principally due to the fatality from the seven principal zymotic diseases, to which twenty-eight deaths were referred during the six months, against but eleven in the whole of the year 1874. These twenty-eight deaths were equal to an annual zymotic rate of 3·6 per 1,000 during the six months, or 21 per cent. of the deaths from all causes, and included seventeen which were referred to whooping-cough, eight to fever, and one each to measles, scarlatina, and diphtheria. The fatality of whooping-cough included seven in the first, and ten in the second quarter of the year. Of the eight deaths from fever four were returned both in the three months ending March and June respectively. This death-rate from fever, which is equal to an annual rate during the six months of 1 per 1,000 persons living, would be high for a crowded manufacturing town, and is all the more remarkable in a watering place which has till recently showed so low a death-rate from zymotic diseases.

In a recent bi-annual report, Dr. Fussell, the medical officer of health, called attention to the fact that with the exception of some ill-adapted rooms at the workhouse which are used as infectious wards, the town of Eastbourne contains no accommodation for the treatment and isolation of cases of infectious disease. This matter has been under the discussion of the board of guardians for some time, and the sooner something definite is done in the matter the better it will be for the true interests of Eastbourne. The utility of such a hospital, more especially in a watering place, depends in great measure upon its being available for non-pauper patients, and with this view it would be more desirable that the urban and rural sanitary authorities of Eastbourne should combine to provide such an institution, rather than it should be built by the guardians, in which case none but paupers could be admitted.

It is always difficult to account, more especially without careful local investigation, for an apparently sudden outbreak of zymotic disease in a town which for a long period has been especially free from such a visitation. Such a visitation can, however, no longer be regarded as the result of chance, and it is clearly the duty, as much as it is the interest, of the sanitary authorities of Eastbourne to investigate its cause, and to restore the reputation of this town as one of the healthiest of English watering places. A tidal outfall for the sewage of a town is full of difficulty, as regards the efficient ventilation of the sewers, and having heard more than one complaint of the nuisance arising from the escape of sewer gas into the hotels and houses of Eastbourne, we can only most earnestly suggest to the medical officer of health and the sanitary authorities of Eastbourne, that the more efficient ventilation of the sewers requires their most serious attention.

EASTBOURNE, a pretty sheltered village, lying among low hills, one and a half miles from the sea, was the nucleus of a sea-bathing station, which was a favourite one in the commencement of the century. A great recommendation was the facility of communication between it and the metropolis, for a stage coach went thrice a week to London and there was a daily post. Eastbourne had a theatre, which, though small, had a decent company of actors. A bath-house and lodging-house had at that time been established by the sea-side, but though it was a quiet, pleasant place, with excellent sea air, it made little progress till 1851, when the Registrar General's returns called attention to its healthiness, no doubt the result of its bracing air. Since the railway reached it, the place has gone on rapidly increasing. The population, which in 1861 was 5,800, was in 1871 10,400. Eastbourne is no longer remarkable, as the guide books of 1864 said, for its extreme quiet and the absence of the ordinary amusements of watering places. It is now crowded and fashionable, and in the season expensive.

Along the sea coast, and far away from the original village, plenty of new houses in rows and terraces have arisen. Sussex Gardens and Victoria Place are among the handsomer buildings. There is a grand and a marine parade, and at their junction the new pier runs for 1,000 feet into the sea. The great and prominent object of the view is the fine promontory of Beachy Head.

Much attention has been paid to the sanitary arrangements of the place, in which the Duke of Devonshire, the chief proprietor, has taken a lively interest.

Eastbourne boasts of a fine convalescent hospital, in which 200 beds can be made up. It is particularly rich in private schools, and has a college. Eastbourne, like Mar-

gate, is a favourite place to which to send boys having any strumous tendencies, for their education.

There are many churches.

On the way towards Beachy Head is a spring called the Holy Well. It used to be called a chalybeate, but as far as we can learn it only contains a few grains of lime, and resembles in its virtues the old hot wells of Bristol, once in such repute, but now removed in process of widening the river. The holy well is little if at all used.

The walks, besides the favourite one to Beachy Head, are to the old village of Eastbourne, where the fine parish church continues to be an object of interest; to various villages in the neighbourhood; to Pevensey, with its old castle and the bay where William the Conqueror landed; and to Hurstmonceux, already mentioned.

In the way of recreations there is good bathing with abundance of bathing machines. There is of course boating, and there are a cricket and croquet ground. There are races in spring and a regatta in autumn, and in winter there is a pack of hounds kept, as it was in the beginning of the century, followed by those 'who can so far stifle their feelings as to enjoy the amusement of more barbarous ages.' The amusement is still, we believe, followed with undiminished zeal, even in this age of advanced civilisation.

As we may have no other opportunity of mentioning it, we shall here allude to SEAFORD, which is situated a little to the east of Newhaven, the port for Dieppe. It was said in 1803, that though this place sent two members to serve in Parliament, and possessed the privilege of a cinque port, it was only a small fishing village. Of late years, however, it has taken up the fashionable trade of becoming a bathing-place.

The trade has, unfortunately, long been dull and not very successful. Since the growth of Newhaven and the construction of a railway, Seaford has developed a little, and there has been some building; but the houses have not been first-class ones, and the view of the sea from their lower windows is interrupted by a high bank of shingle. The bathing ground too is unpleasant, and not very safe. We have known families spend successive years at it, but they were never anxious to return, preferring places that afford more variety. Seaford being west and inside of Beachy Head, which intervenes between it and Eastbourne, must be much less exposed to the influence of east winds than that place, which is, indeed, quite open to them. On the ground of the healthiness of the place, a convalescent hospital with fifty beds was established here in 1860.

We shall now continue our remarks on sea-bathing and sea-air. Hitherto we have spoken chiefly of the agreeable and curative effects of sea-air, but like all other remedies, it does not suit all people. Those of us who have been born and bred on the sea-coast, can scarcely appreciate the effects of sea-air on those not accustomed to it. But many people, especially ladies, find sea-air too exciting. Many, instead of being soothed by the sounds of the ocean, become restless, cannot sleep, and long to get away. Strong people with a tendency to bilious derangements, sometimes complain of nausea, vertigo, and frontal headache; in fact, the first threatenings of sea-sickness may occasionally occur to any new-comers who spend much of their time on the promenades by the sea-side. Probably these effects may be partially attributed to the effects of increased appetite followed by over-feeding. Still no one can dispute the fact that sea-air suits some people and not others.

There is also a certain feeling of lassitude and of sleepiness which is sometimes attributed to the influence of sea-air, but we doubt much whether it is ever experienced except when too frequent and too prolonged baths have been taken in hot weather. A patient who is about to go through a course of sea-bathing or of hydropathy should have a certain amount of stamina, and must not be one of feeble powers of reaction. To many the feeling of the skin after a sea-bath is unpleasant; owing to the hygrometric qualities of sea-salt there is a certain amount of clamminess left, and many are not comfortable till they have washed in fresh water. But authority is in favour of the notion, that if salt is ever absorbed by the skin, it is most likely to be so when it has remained in contact with it for some hours, and if that be so the surface should remain unwashed. It is always an open question whether women should protect their hair or not in the usual way from the salt water. There is no doubt that salt water makes the hair fall out; but it generally comes again. On the whole, there is so much trouble in drying and cleaning the hair, which requires the affusion of fresh water, that it is better not to wet it; although young ladies may form less picturesque objects, than when they stroll about with their long hair down their shoulders for the purpose of drying it. But some more disagreeable effects may result from the use of sea-water baths. In certain individuals even a very short immersion causes a tendency to faint, along with blueness of the fingers, attended or followed by severe headache; the depression may be so great as to require the application of external heat, and of the usual restoratives. In children we have often heard this severe headache complained of. In a good many people sea-water produces eruptions, often of an erythematous character: this we have seen occur over and over again. In cases of cutaneous eruptions, sea-water sometimes aggravates them at first, the ultimate effect, nevertheless, being good, as in the case of some mineral waters. But whether this may be a good sign or a symptom of intolerance of the waters must be decided in each particular case by a physician of experience. There is, undoubtedly, in some people an idiosyncrasy which makes sea-water unsuitable for them.

Besides such individual peculiarities, and the extremes of childhood and of old age which have been alluded to, there are other causes which may forbid sea-bathing or even residence by the sea side.

Some extremely anæmic patients, particularly women, may find sea-air what is called too strong for them, and will do better in the interior, or in mountain air.

While the slighter forms of dyspepsia improve at the sea-side, those depending on alterations of the mucous membrane of the stomach, or on changes in the structure of the liver, are better away from it.

Congested liver and imperfect secretion of bile are not likely to be relieved by sea-bathing, although the internal use of sea-water might be of use. No one would advise sea-bathing in excessive plethora, any more than in excessive anæmia. Where there is any tendency to swimming in the head, or to epileptic and other fits, it is, to say the least, a doubtful remedy, even when used with care. Sea-bathing is of course contra-indicated in disease of the heart, in valvular insufficiency, and in atheroma of the arteries. As regards pulmonary cases, in most pneumonic exudations, in decided tuberculosis, and in hæmoptysis, sea-bathing is contra-indicated. It need scarcely be said that sea-bathing cannot be practised in acute rheumatism, although that disease is sometimes treated in-doors with wet applications. It may be added, that in cases of ear affections, even when the ears are sound, it may be well to take measures to exclude the access of sea-water in bathing.

Further, with respect to various affections of the eyes and eyelids, the sea-side sometimes does them harm. At all events, patients suffering from them should reside in localities where they are not exposed to the full glare of the sea. Indeed, many who complain of no delicacy of their eyes dislike the glare and want of shelter so common in many of our newest sea-side resorts.

MR. CHARLES SEMON, of Bradford, and Broughton Hall, near Skipton, has expended 8,000*l.* in erecting a substantial and attractive residence for the convalescent. The benefits of this institution are open to the entire kingdom. The building has accommodation for sixty inmates, and stands on an elevated site, commanding extensive views of the most charming scenery in the West Riding.

Parliamentary Proceedings.

HOUSE OF COMMONS.

(Tuesday, July 27.)

POLLUTION OF RIVERS.

MR. TENNANT asked the President of the Local Government Board whether, having regard to the pressing necessity of some measure for preventing the pollution of rivers, Her Majesty's Government would give an assurance that they would early in the next session introduce a bill for that object, and would in the meantime make such inquiries and investigations as would enable them to deal effectively with the whole question.

Mr. Sclater-Booth: It is rather early days for the Government to pledge themselves as to what specific measures may form part of their programme for next session, but my hon. friend may rest assured that the pollution of rivers is a subject of so much importance and of such growing interest that it cannot fail to occupy their serious attention during the recess. For myself, I can readily promise him that no pains will be wanting on my part to collect any further information which may be required for dealing with the subject effectively. (Hear, hear.)

Law Reports.

BRIEF NOTES OF CASES.

LEGAL PROCEEDINGS.

1873. *Reg.* v. *Foulkes.* The son of a clerk to a local board living at home and receiving no salary held rightly convicted of embezzling the moneys of the board although not directly employed by the board (44 L. J., M. C., 65).

LEGAL PROCEEDINGS: MANDAMUS.

1875. *Reg.* v. *Peterborough, Mayor.* 'Municipal Corporations (Borough Funds) Acts, 1872.'—Application for *Mandamus* for a poll refused. It appearing that the applicant through a ratepayer, was personally interested in the bill respecting which he desired a poll (44 L. J., Q. B., 85).

WATER COMPANY POWERS.

1875. *Bush* v. *Trowbridge Waterworks Co.*—Abstraction of Water—'Waterworks Clauses Act, 1847,' sec. 6.—An owner's remedy for loss of water is compensation under the 'Lands Clauses Act, 1845,' sec. 68.—He cannot compel the purchase of a portion of a stream. (W. N., 1875, p. 89; 32 L. T. 182; 39 J. P. 261.)

BORROWING POWERS OF SCOTCH SANITARY AUTHORITIES.

IT may not be generally known, but it is a fact, that the municipal authorities throughout England can at present borrow money for sanitary purposes at a much lower rate of interest than the same authorities in Scotland. This fact was recently brought to light in consequence of the town of Paisley wishing to borrow money for the erection of a hospital. Under the Public Health Act of 1872, England can borrow money for sanitary purposes at the rate of 3½ per cent. interest, repayable in fifty years. Scotland, on the other hand, under the Sanitary Acts of 1867 and 1871, cannot borrow under 5 per cent. interest, and the money has to be repaid in thirty-five years. Kirkintilloch, Tranent, and other places having urged the desirability of Scotland being placed upon the same footing as England in this matter, the Lord-Advocate has introduced a bill which will secure this object, and, as there is no opposition to it, it will, no doubt, pass this session, and so help on the cause of sanitary progress in Scotland.

INFECTION BY WASHING LINEN.

A RETIRED tradesman at Darlington has been fined 20*s.* for neglecting to take proper precautions to prevent the spread of infection from a case of small-pox which was in his house. The defendant sent bedding and clothes without information respecting them to a laundress, and in the house where the infected clothing was washed a boy subsequently contracted the disease and died. This seems to us to be a case in which the magistrates quite failed in their duty. Twenty shillings for killing a boy is a sum in no proportion to the offence, even to put the matter as one simply of £ *s. d.*

PROCEEDINGS UNDER THE SMOKE ACT.

T. GOWLAND, a stoker, was summoned on behalf of the Commissioners of Police, for that he, at 370 Holloway Road, did so negligently use a certain furnace employed on the said premises as that the smoke arising therefrom was not entirely consumed or burnt.—Mr. Wakeling appeared for the defendant.—Police-constable Timberlake said, on the morning of May 31 he saw dense black smoke issuing from the premises of W. Beale, confectioner. He went in and saw the defendant. Asked him whether he was the stoker in the presence of Mr. Beale; he answered in the affirmative. Witness then asked defendant whether he had any complaint to make as to the furnace or fuel, and he said 'None.'—Mr. Sanderson, Government inspector, said smoke was reported on May 17. He had visited the defendant's master's premises, and found there was a good and sufficient furnace to consume the smoke if properly used.—Mr. Wakeling, for the defendant, said he was glad these were the only occasions of the chimney smoking. On the morning in question the fire was lit, and the furnace supplied with fuel. Shortly after the constable came in, and said the chimney had been smoking. Mr. Beale used Camp's Patent Smoke Preventer, but he (Mr. Wakeling) submitted that the smoke could not be consumed until there was a fire to consume it, and the fire had to be got up, and had just been lit as the constable came in; and he, under the circumstances, asked that the summons be dismissed.—Witnesses having been called in corroboration, the magistrate dismissed the summons.

THE POWERS OF WATER COMPANIES.

THE Master of the Rolls has had before him the case of *Low* v. *The Lambeth Waterworks Company*, which raised the question whether, under the Act of Parliament relating to water companies, the defendants were bound to supply to the plaintiff, on payment merely of the ordinary water rate, water not only for domestic purposes, but also for watering a garden. His Honour held that the defendants were not so bound, but could charge for water used for watering the garden according to a tariff under the Act.

This decision is one of no small importance both to water companies and the public, who, speaking generally, are already too much at the mercy of the companies. 'A Solicitor' writes: 'It would appear that the Legislature has conferred powers on the water companies of charging doubly for the water supplied by them. In the majority of cases, especially in the case of suburban residences, high rents are obtained by reason of their having gardens and stabling attached. As the water rate is assessed upon the rental, and the company are entitled to charge a further rate for the enjoyment of the garden and use of the stabling, they practically get it twice over. If the rate for the supply for domestic purposes was based on the value of the dwelling-house only, it would be another matter.'

This is undoubtedly true as regards the suburban districts of London, though less true of the country generally. We shall watch the future course of this controversy with no small interest, because it can scarcely happen that the effects of the decision will be limited to Lambeth only.

VOTING AT PAROCHIAL ELECTIONS.

IN the case of *Smith* v. *The Overseers of Seghill*, just decided by the Court of Queen's Bench, the overseers had omitted to insert in the rate-book the names of a large number of colliers, and the question was whether this omission rendered them liable to a penalty under section 19 of the Poor-Rate Assessment and Collection Act, 1869. This section requires that the overseers shall enter in the rate-book the name of every occupier of a rateable hereditament, whether the rate is paid by him or the owner, and such occupier shall be deemed duly rated for purposes of the franchise. The section also enacts that an overseer omitting to do this shall be liable to a penalty. The colliers, whose names it was desired to have entered on the rate-book, worked for a colliery proprietor who provided for his colliers either houses or allowances for houses. It was contended that these men were occupiers, and that the occupation by them ot the houses was merely ancillary to their service, such as the occupation of coachmen or gardeners often is.—The Court, however, were clearly of opinion that the colliers were occupiers within the meaning of the section, and entitled to vote.

This case is one of considerable importance, and may have even now extensive application, for we are acquainted with more than one local board district, besides Seghill, in which the cottage occupiers were deprived of their votes for several years after the passing of the Act of 1869, and this in spite of the very explicit language of that Act.

'PREPARED COCOA.'

IN the case of *Gibson* v. *Leaper*, recently before the Court of Common Pleas, it appeared that the appellant, a grocer at Spalding, upon being asked for a quarter of a pound of cocoa, delivered an ordinary packet of Epps's cocoa, without making any verbal statement. Upon the face of the packet were the words 'Prepared Cocoa; for ingredients see the other side,' and upon the back, 'Cocoa contains a bland oil which is pre-eminent as a vitalizing substance; to render the oil soluble and easy of digestion, it needs to be combined with just so much loaf sugar and West India arrowroot as will effect its perfect incorporation. In the preparation of the cocoa contained in this packet we guarantee that no other ingredients than those mentioned are used.' The respondent had the cocoa analysed, and it was certified to contain '40 per cent. of cocoa, 44 per cent. of sugar, and 16 per cent. of starch.' The information, under section 2 of the Act, charged the respondent with having sold as unadulterated cocoa, cocoa that was adulterated. The justices convicted the defendant. The Court quashed the conviction, holding that, assuming the cocoa could be properly said to be 'adulterated cocoa,' still it had not been sold as unadulterated. The mere handing of the packet did not constitute a complet sale. It was open to the purchaser if it did not correspond with what he wished for to reject it. Here there was a printed statement which immediately brought to the notice of the purchaser the fact that the article was a preparation of cocoa and other ingredients. Therefore, whether it was true or not that the mixture of some such ingredients was necessary, this cocoa could not be said to have been sold as unadulterated.

IMPORTANT NUISANCE CASE.

AT Worship Street Police Court, W. Henson, a tripe-boiler and fat-melter of Well Street, Hackney, has been summoned for carrying on his business so as to be a nuisance and injurious to health.—Dr. Tripe, medical officer, said that he visited the defendant's premises, having received several complaints. The defendant said that there was some smell the night before from boiling paunches, but that was an accident. Witness entered the boiling-house and found it in a filthy state. Offal was kept there and boiling was done, and the whole was shockingly dirty. There were two boilers, one containing offal, which smelt most horribly, making him almost sick. There was fat about in tubs, which also smelt so bad that if witness had not left the place he would have been sick, and his stomach was not easily turned. There was no fit boiling apparatus, no means of carrying off the smell, and no proper ventilation.—The defendant said that he had been laid up for some time, and his business had been neglected. A number of persons residing in the neighbourhood attended to depose to the nuisance. Three residents, who complained of being made sick by the smells, were examined. From their evidence it appeared that beside the melting-house there was in close contiguity a cow-shed with twenty or thirty cows, a pig-sty with forty pigs, a stable in which about sixty horses were kept, and a tripe-shop in which boiling was done.—Mr. Hannay remarked that bad smells were not necessarily injurious to health, as proved in police courts, but they were not pleasant.—The defendant said that but for his being ill this would not have happened, as his business had been mismanaged.—Mr. Hannay said that Dr. Tripe complained that it had made him sick, so that it might have caused defendant's illness.—He fined him 3*l.* and 12*s.* 6*d.* costs.

THE PUBLIC LIBRARIES ACTS.

THE Court of Queen's Bench, on May 27, in the case of *Donovan* v. *The Vestry of the Parish of St. Matthew, Bethnal Green*, settled an important question as to the mode of ascertaining the sense of a parish or other popular body on any subject of public interest—as for instance, with reference to the adoption of an Act of Parliament. It has been settled in several cases that, as a general rule, at Common Law there is a right to 'demand a poll;' but the question now arose again under the Public Libraries and Museums Act, 1855—which provides that, on the requisition of ten ratepayers, the overseers should appoint a public meeting of ratepayers to determine whether the Act should be adopted, and, 'if at such meeting two-thirds of the ratepayers then present shall determine that the Act ought to be adopted for the parish, it should come into operation.' The Scotch Act contains a similar enactment, adding, however, these words: 'unless a poll shall be required;' and then the Public Libraries Act of 1866—an Act to assimilate the law of the two countries on the subject—repealed so much of the Scotch Act as authorised a poll, and also repealed the clause as to a majority of two-thirds, leaving it sufficient that there should be a simple majority at the meeting. This being the state of the law, a public meeting was regularly convened in the parish of St. Matthew, Bethnal Green, at which a majority agreed to adopt the Libraries Act, in order to establish a public library in the parish. One of the dissentients, however, demanded a poll, which was refused by the rector, he being advised that it was not allowable by the law as it stood, and that the votes of those present at the meeting must decide. The vestry refused to carry out the resolution, and this was an application for a *mandamus* to compel them to do so, which was opposed on the ground that the resolution of the meeting was invalid. It was argued in support of the resolution of the meeting that the original Act did not authorise a poll, and that the last Act clearly assumed that a poll was authorised only under the Scotch Act; but after full argument, the Court delivered judgment against the application for a *mandamus*, on the ground that the resolution of the meeting was not binding upon the vestry, a poll having been refused, and the Court could not by *mandamus* enforce it.

BUILDING BY-LAWS.

SIR,—Your reply to the chairman of the Ilfracombe local board, contained in the SANITARY RECORD of July 3 seems to interrupt the action of by-laws very materially (especially in old towns), and if made to operate may perpetuate for another century evils which it is the object of these by-laws to remedy so soon as there is reasonable ground for their salutary operation.

Do you mean that if a shop in a main street be pulled down to the floor which is level with the street pavement, so that nothing is left between this ground floor and the firmament, that then plans need not be submitted for the approval of the Local Board, and any kind of superstructure which infringes all, or any of the by-laws, with totally different internal arrangements, and in the case of a narrow street, the new building (!) may be carried up to any height, and the back premises enlarged or altered just as though no by-laws existed? T. R.,

Local Board Surveyor.

Correspondence.

A LIVERPOOL SUBURB.

(*To the Editor of the* SANITARY RECORD.)

SIR,—I most cordially agree with 'Huytonian' in his description of this 'important suburb of Liverpool.'

The rateable value of Huyton is 23,905*l.* and Roby 11,524*l.*

Huyton and Roby are the only townships in the Prescot union united for poor-law purposes, and there can be no doubt it is an unhappy union. Whatever the 'Huytonians' suggest or attempt for the improvement of Huyton-cum-Roby, the people of Roby oppose. This was the reason why 'Huytonians' adopted the Local Government Act of 1858 for Huyton, without including Roby; and to show that Huyton was large enough to be an urban district, it is only necessary to say that in the year 1873 the Local Government Board sanctioned twenty-six local boards, seventeen of which had a less rateable value than Huyton.

The report of Mr. Arnold Taylor, one of the Local Government Board's inspectors, describes Huyton as 'a district of handsome villa residences occupied for most part by Liverpool merchants,' and further, that 'he has come to the conclusion that a very substantial majority of the ratepayers are in favour of the township being an urban district;' and he says also, 'I see many good reasons why, for all purposes of local government, Huyton and Roby should form one urban district.'

On the 'Huytonians' adopting the Act, our Roby neighbours sent a memorial to the board stating, 'we have not been heard on the union of the two townships,' and expressing a wish that nothing should be done without the township of Roby being consulted and allowed an opportunity of expressing its views.

A meeting of the ratepayers of Huyton and Roby was called in compliance with this wish, to carry out, if possible, the inspector's report; but it was packed by Roby and they refused to hear the report of the committee read and treated Mr. Taylor's report with derision and contempt. A majority voted against the two townships being united as an urban district. A poll was demanded, but undue influence was used to get people to vote against a local board for the two places, and a majority voted against it. The voting, however, did not affect Huyton, as it had adopted a local board; but when application was made, the Local Government Board refused its consent.

I give a list of memorials signed by the Huyton ratepayers now lying at the offices of the Local Government Board.

1. Memorial sent to the board when the Act was adopted without a dissenting voice, signed by sixty-two ratepayers; rateable value of those who signed about 4,000*l.*

2. Memorial which was handed to the inspector of the inquiry on the spot, signed by ninety-three owners whose rateable value is over 6,000*l.*

3. Memorial presented to the guardians of the Prescot Union, asking them to recommend the separation of Huyton from Roby for poor-law purposes, signed by 116 ratepayers representing a rateable value of about 8,400*l.*

4. Memorial presented to the Local Government Board asking them to separate Huyton from Roby for poor-law purposes. Signed by 120 ratepayers; rateable value about 7,000*l.*

5. Memorial signed by eighteen large property owners and ratepayers, asking the board not to grant urban powers to the rural sanitary authority without an inquiry at Huyton. This represents a rental of 5,000*l.* a year.

This will show that the Huyton ratepayers were fully alive in the three years 1873-74-75. 'Huytonian' wants the readers of your valuable sanitary journal to believe that the inhabitants 'are now fully alive to the sanitary defects of the district, and are working vigorously with a parochial committee under the rural sanitary authority.'

The majority of the ratepayers in Huyton have no confidence in parochial committees, or in the rural sanitary authority. 'Huytonian' states the committee 'are determined to have a thorough and complete system of sewerage.' At the present time the committee are making an attempt to get a defective scheme of drainage thrust upon the township which the ratepayers are 'vigorously' opposing. Now that you have the facts of the case before you, you will be better able to suggest 'some course or process for a rural population of 3,500 or likely to be 5,000 before the next census to adopt, and calm 'Huytonian's' troubled spirit.

'The district is losing its reputation as a pleasant and salubrious suburban residence, property is fast depreciating in value, houses are unlet from month to month, extending to years.'

The Huyton people are satisfied there is only one way to restore confidence to both property owners and tenants, viz., the sanction of a local board for Huyton, and to let Roby, as it wishes, remain under the rural sanitary authority.

A RESIDENT IN HUYTON.

Reviews.

Ilfracombe, the Healthiest Devonshire Watering Place.

UNDER the above title a pamphlet has been published by Dr. E. J. Slade-King, the medical officer of health of this favourite North Devonshire watering place. This description of Ilfracombe we can cordially recommend to all past, present, and intending visitors; to most of the residents it is probably well known. At the same time, however, that we bear willing testimony to its readableness, and the amount of information contained in the pamphlet, we feel bound to enter a protest against the claim, which is urged in the title, that Ilfracombe is the healthiest watering place in Devonshire. It is fair to state that this claim is based upon the average annual rate of mortality in the ten years 1861-70 in the registration sub-district of Ilfracombe, as published by the Registrar General in his annual Watering Place Table. Measured by this test, which, it must be remembered, is but a very rough test after all, the death-rate in Ilfracombe was lower during those ten years than in any other Devonshire watering place in this table. We do not dispute the value of this evidence of the healthiness of Ilfracombe during those years; but fully recognising the many difficulties which beset the estimation of the sanitary condition of a watering place from a mere inspection of the death-rate, we cannot but regret a growing tendency to write up this or that place as the healthiest. A proper examination of mortality statistics will soon show whether a place is healthy or otherwise; if the death-rate from all causes, and especially from zymotic diseases, and also the rate of infant mortality, are low, the health of the population is generally satisfactory. Among healthy places, however, it would be unsafe to attempt to decide which is the healthiest. Moreover, it should be remembered that a place in which a remarkably low death-rate prevailed in the ten years 1861-70, may not now be entitled to call itself the healthiest; we say this with no personal reference to Ilfracombe, as its vital statistics during the four

and a half years since 1870 do not happen to be now before us. What we have said is merely intended as a protest against competitive claims among watering places, which it would be extremely difficult to maintain, and might mislead the public. If the vital statistics of a place will bear careful and impartial investigation, it is perfectly admissible to point out and make the most of their best features; but it appears to us to be sufficient to prove a place healthy, without urging a claim that it is actually the healthiest.

Those who read Dr. Slade-King's pamphlet, even if they do not know Ilfracombe, will be readily convinced that it is possessed of natural advantages of situation, beauty of scenery, climate, etc., such as few watering-places can boast of. The medical officer of health also pronounces the drainage to be satisfactory, and the water-supply abundant and of excellent quality. With reference to the climate, a complete series of meteorological observations for the four years 1871-4 is contained in the pamphlet, which will materially assist the consideration of the claims of Ilfracombe, both as a winter and summer resort. It is stated that the mean temperature of the six months ending May in the past five years has been 46·8; and that the temperature is generally remarkable for uniformity. Snow seldom falls, frost is unfrequent, and the greatest degree of frost observed in a period of ten years was 7·5°. We could wish that in this pamphlet the vital statistics of Ilfracombe had been treated as carefully as the meteorology; and we may hope that in a third edition (the second is already published) Dr. Slade-King will not rest satisfied with Ilfracombe's good reputation in the ten years 1861-70, but will show us that its repute as a health resort has since been fully maintained.

The Influence of Social and Sanitary Conditions on Religion. By HENRY W. ACLAND, M.D., F.R.S. James Parker & Co. : Oxford and London.

A NOTE on the title-page states this to be a paper *read* at the Brighton Church Congress. We would rather believe that it was *spoken* on that occasion. This supposition might then account for the number of platitudes, and for the word-padding which fill nineteen pages of paper and occupied twenty minutes of time.

Dr. Acland had a grand subject; he might have shown how intimately sanitary science is connected with those deep feelings which some men call 'religion.' He might have enlisted the enthusiasm which belongs to worship and belief on the side of health. He might have aimed at saying something which would have made every hearer realise that the care of the body is a religious duty, though they differed as to the meaning of the word religion. Instead of this, he has contented himself with bald statements 'that intemperance and unhealthy dwellings render men less capable of religious excellence;' 'that in promoting administrative measures to remedy these evils, the clergy are aiding the religious progress of their flocks.' These, set off by a few flowers of language and by a few compliments to the House of Lords, are all that Dr. Acland has to say of the influence of sanitary conditions on religion. He has yet to learn that influence on the clergy is not the same thing as influence on religion, and that sanitary science has a harder struggle before it than that of making young clergymen put into motion the sanitary machinery, 'which is now all that can be required for the country.' After listening to such a paper, we fear the audience must have left the hall as much mystified by the medical as they had been by the clerical discussions which took place. No idea, no impression could have remained after their minds had been tossed for twenty minutes on a sea of words, in which heads of subjects appeared only for a moment to be lost again in rushing sentences about nothing. The time and subject were ready, but the man was wanting.

Health in the House; being a Course of Twenty-five Lectures on Elementary Physiology, in its Application to the Daily Wants of Men and Animals. By CATHERINE M. BUCKTON. London: Longmans, Green, & Co.

THE above volume consists of a collection of the illustrated lectures delivered to the wives, children, and working-men in Leeds and Saltaire by Mrs. Catherine Buckton. These lectures are the outcome of an earnest desire on Mrs. Buckton's part to ameliorate the condition of the poor. The efforts of the lecturer were first directed to penetrate the dense ignorance and apathy which abounds generally among the working classes. The lectures given by Mrs. Buckland were in all twenty-five, the two first commencing with the air we breathe and the requisites for good health; impure air the cause of fever; treatment of fever, ventilation, and directions for sickness. Lectures three, four, five, six, seven, eight, and nine are devoted to elementary anatomy, physiology, the skeleton, joints, muscles, circulation, respiration, brain and nervous power. These are followed by two on digestion, and by a natural transition, a course of five lectures on food of every variety and their relative effects on the system. Then come four discourses on cooking, and four more on the nerves and hearing, light and sunshine, the voice, and the treatment of animals; concluding with a table of the foods and their relative values; cruelty to animals; hints for emergencies. The series is well and suitably illustrated, and a series of questions, based on the subject of each discourse, is given. This is a useful feature of the work, and one convenient alike to the lecturer and the learners or audience.

Mrs. Buckton has executed her self-imposed task in a singularly clear and comprehensive manner, and we cordially recommend her book to the attention of those ladies who may be desirous of instructing and elevating the condition of the working classes.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

BALY, Joseph Sugar, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Leamington Urban Sanitary District at the increased salary of 80*l.* per ann.

HUTCHINSON, Valentine, M.D. Univ. St. And., M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the No. 3 Sub-district of the Auckland Rural Sanitary District

ILES, Daniel, M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the First Division of No. 3 Sub-district of the Northleach Rural Sanitary District, vice Barnardo, resigned.

KILBURN, William Byers, M.R.C.S. Eng. and L.M., L.S.A. Lond., has been re-appointed Medical Officer of Health for the No. 2 Sub-district of the Auckland Rural Sanitary District.

MCKANE, George O., L.R.C.P. Edin. and L.M., L.F.P.S. Glasg., has been appointed Medical Officer of Health for the No. 1 Sub-district of the Auckland Rural Sanitary District, vice Manson, whose appointment has expired.

MOORMAN, Mr. William, has been appointed Surveyor and Inspector of Nuisances for the Leckhampton Urban Sanitary District, vice Morland, deceased.

PRITCHARD, Mr. John Parrock, has been appointed Inspector of Nuisances for the Lichfield Rural Sanitary District, vice Coxell, resigned.

ROBERTSON, James, L.R.C.S. Edin., has been appointed Medical Officer of Health for the Parish of Fourdoun, Kincardineshire, vice Henderson, deceased.

SWEET, Mr. Stephen, has been re-appointed Inspector of Nuisances for the St. George Urban Sanitary District, Gloucestershire, his appointment for two years having expired.

VACANCIES.

BERWICK-UPON-TWEED URBAN SANITARY DISTRICT. Surveyor and Inspector of Nuisances: 140*l.* per ann. Application, 7th instant, to J. C. and R. Weddell, Clerks to the Authority.

CARDIFF RURAL SANITARY DISTRICT. Inspector of Nuisances for the Southsea Division: 150*l.* per ann. Application, 20th instant, to W. P. Stephenson, Clerk to the Authority.

CARNARVON RURAL SANITARY DISTRICT. Medical Officer of Health for the Llandwrog Sub-district: 15*l.* per ann. Application, 20th instant, to J. H. Thomas, Clerk to the Authority.

CONWAY RURAL SANITARY DISTRICT. Inspector of Nuisances: 120*l.* per ann. Application, 20th instant, to T. E. Parry, Clerk to the Authority.

ROCHDALE URBAN SANITARY DISTRICT. Medical Officer of Health: 300*l.* per ann., with office and all office requirements. Application, 7th instant, to Z. Mellor, Town Clerk.

TREDEGAR URBAN SANITARY DISTRICT. Surveyor.

WESTON-SUPER-MARE URBAN SANITARY DISTRICT. Surveyor: 175*l.* per ann. Application, 10th instant, to William Smith, Clerk to the Authority.

SANITARY PATENTS.

2401. Improvements in house-traps for preventing the passage of sewer-gas into dwellings from sewers, drains, or cesspools. Edward Gregson Banner, Billiter Square, London.

2044. Utilising dilute chlorine. Walter Weldon, the Cedars, Putney, Middlesex.

2142. Supporting respiration and light in suffocating or explosive atmospheres. John Imray, Southampton Buildings, Chancery Lane, London.

859. Stoves or fireplaces. Henry Crichley, Birmingham.

2189. Filters. Richard Gervase Elwes, Westminster Chambers, Westminster.

2308. Clearing the streets from mud, etc. Edward Hodgson Bayley, Newington Causeway, Southwark, Surrey.

ABSTRACTS OF SPECIFICATIONS.

4468. Ventilating buildings, etc. T. J. Hogg, Fleming Road, Kennington Park.

The novel features of this invention consist in the use of a suctional or exhausting chamber, into which the impure air is drawn from a room or other situation, such chamber having perforated shelves and an internal rotating fan wheel; the chamber is connected by a pipe to a reservoir in which a second rotary fan is placed, and thence the air is conveyed to a condenser by a pipe; non-return valves are applied to the reservoir and condenser; the latter is provided with an air-box, into which external air is admitted to aid the current, the air-box having a valve to prevent egress of air from the condenser to the inlet air-pipe. The current then proceeds to a discharge-pipe, and is further aided by external air impinging at right angles into an aperture cut therein about midway of its length. In other examples the discharge-tube is dispensed with, and the current is conveyed to a gas lamp ventilator. So also for sewers, ships, chimney flues, or otherwise; one or more portions of the invention are dispensed with or slightly modified.

4480. Closets or commodes. W. Martin, Newton Heath.

This invention consists in each case in the employment of a box having in one corner a perforated partition and at the bottom a hole leading to an under box or filter containing a series of circulating chambers or passages formed by a number of metal or wooden partitions having at their alternate ends parts cut away. These chambers are filled with deodorising substances or materials, and when the solid or semi-solid fæces and urine pass into the upper box, the urine and water in the fæces pass through the perforated partition and hole into the lower box, where they circulate from front to back over the parts cut away at the tops of the partitions in the lower box, and through the disinfecting materials in the several chambers, from whence the liquid passes through a hole and pipe in the state of water comparatively pure, the solid parts of the urine remaining in the disinfecting materials. These portable boxes are to be placed under the seats of ordinary privies, the liquid passing to the sewers, and the box with the solid matters and disinfectants being changed for another from time to time, and when applied to commodes the liquid is for a time collected in a vessel, or runs away to the drains through a pipe supplied for the purpose.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer—not necessarily for publication.

PREVENTION BETTER THAN CURE.

THE writer of a thoughtful and well written article on House Ventilation and Warming, in the current number of the *Westminster Review*, remarks of preventive measures:—Of all the fallacies that delude mankind, none seems more marvellous, while none is so common, as that money directly expended to promote health is money lost. The consequences of ignorance and neglect are termed 'accidents,' or the will of God, and are required to be met, not by intelligence and energy, but by resignation. Impaired faculties, debilitated strength, loss of time from sickness, and of money in medical expenses; hereditary debility, tainting the offspring and entailing physical suffering, mental anxiety, and, perhaps, insanity; does all this cost no money? Is there no indirect outlay, no negative loss, no social misfeasance, no lost opportunity? 'Every man has business;' all have duties; and none can live to self alone. If we are reckless as to ourselves—do, in fact, 'what we like with our own'—is society uninjured? Do not our misdeeds sooner or later affect the mass, and does not the well-being of the mass react upon ourselves? If so, an intelligent regard for the laws of health is at once a gain, an enjoyment, and a social duty; and, if so, then neglect ought to be made a matter of conscience and necessity.

A NEW USE FOR GLYCERINE.

M. SCHERING states that glycerine may be burned in any lamp so long as the flame is kept on a level with the liquid. The latter, on account of its consistence, will not ascend an elevated wick. As the flame, like that of alcohol, is almost colourless, and as the material is especially adapted for absorbing a large proportion of saline substances, M. Schering has recently made experiments in colouring the flame with various bodies, and with satisfactory results. By introducing substances rich in carbon, it appears that the flame may be rendered suitable for illuminating purposes. The low price of glycerine and its property of not volatilising at high temperature, add to its advantages in this direction.

THE ACTION OF SULPHURIC ACID ON LEAD.

ACCORDING to the *Berichte* of the German Chemical Society, the action of sulphuric acid on lead and its alloys has recently been studied by Herr A. Bauer. On some of the alloys the acid acts slowly, with evolution of hydrogen and sulphurous acid, whilst on others it acts rapidly, with development of sulphuretted hydrogen, sulphurous acid, and hydrogen, and with separation of sulphur. The reaction is greatly affected by the proportion of metals in an alloy of the same constituents, by the purity of the acid, and by the temperature at which the experiment is made. He finds that the presence of small quantities of antimony and copper in lead increases the resistance of the metal to the acid, whilst the presence of bismuth renders it more susceptible to attack.

ELECTRICITY AND VEGETATION.

THE effects of electricity on plants have not been closely studied. It is known to produce contractions in the mimosa and other sensitive plants, and to retard the motion of sap. M. Becquerel has studied its influence on germination and development. It decomposes the salts contained in the seed, the acid elements being carried to the positive pole, and the alkaline portions to the negative. Now, the former are hurtful to vegetation, while the latter favour it. M. Becquerel further examined the influence of electricity on the colour of plants. The discharge from a powerful machine produced remarkable changes of colour on the petals, due, he thinks, to the rupture of cells containing colouring matter. Deprived of this cellular envelope by washing, the flower becomes white.

A NEW HYDRAULIC CEMENT.

A FRENCH chemist is said to have succeeded in preparing a mineral compound, which is said to be superior to hydraulic lime for uniting stone and resisting the action of water. It becomes as hard as stone, is unchangeable by the air, and is proof against the action of acids. It is made by mixing together 19 lb. sulphur and 42 lb. pulverised stoneware and glass; this mixture is exposed to a gentle heat, which melts the sulphur, and then the mass is stirred until it becomes thoroughly homogeneous, when it is run into moulds and allowed to cool. It melts at about 248° Fahr., and may be re-employed, without loss of any of its qualities, whenever it is desirable to change the form of an apparatus, by melting it by a gentle heat, and operating as with asphalte. At 230° Fahr. it becomes as hard as stone, and preserves its solidity in boiling water.

KISSING.

WE extract the following from an American contemporary. The advice therein contained is worth remembering. 'The promiscuous kissing of children is a pestilential practice. Do you remember calling on your dear friend Mrs. Brown the other day with a strip of flannel round your neck, and when little Flora came dancing into the room, didn't you pounce upon her demonstratively, call her a precious little pet, and kiss her? Then you serenely proceeded to describe the dreadful sore throat that kept you from prayer-meeting the night before. You had no design on the dear child's life, we know; nevertheless you killed her! Killed her as surely as if you had fed her with strychnine or arsenic. Your caresses were fatal. Two or three days after, the little pet began to complain of a sore throat, too. The symptoms grew rapidly alarming; and when the doctor came, the single word 'diphtheria' sufficed to explain them all. To-day a little mound in a cemetery is one memento of your visit.'

'Evil is wrought by want of thought,
As well as by want of heart.'

Communications have been received from:

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Original Paper.

HYGIENE.

BY F. S. B. F. DE CHAUMONT, M.D., Edin.
Staff-Surgeon Major, Assistant Professor of Military Hygiene, Army Medical School, Netley.

CHAPTER IV.—HABITATIONS.—*Continued.*

a. Doors and Windows.—In ordinary dwellings, and in most public buildings, these are the only means of ventilation. During cold weather, when fires are lighted, there is also an outlet through the chimney, but in summer the chimney is often closed, and in small rooms boarded up, so that practically the door and window alone are left as means of ventilation. It must, however, be plain that they form but imperfect channels, valuable as they are where we desire to flush the room thoroughly with strong draughts of air. By the opening of the door we are apt to produce unpleasant draughts, besides bringing in merely the more or less vitiated air of the rest of the house, whilst, if the windows be opened at the same time, the existence of unpleasantly strong currents is very likely to be established. In some cases it has been recommended to have an opening at the bottom of the door; but this is objectionable, as a cold current running along the floor cools the feet unpleasantly, and would in all probability become unbearable. A better plan is to have the opening at the top of the door, either as a louvre or a perforated plate, which might be closed by a sliding panel, as in the ventilators in railway carriages.

The windows may be utilised as ventilators by some simple contrivances. Pott's plan is to have a certain number of panes made of perforated glass, by which a slow but constant current of air enters; another plan is to have one of the panes louvred, and capable of being open and shut like the laths of a Venetian blind, a corresponding opening being, of course, made in the shutter for use when the latter is closed. In Boyle's ventilator a part of the pane can be opened or shut at will by a spring arrangement. When draughts are feared from the directly open window a good plan has been suggested, where a piece of gauze or perforated zinc is so arranged as to fill the space when the window is opened; by this the force of the current is moderated and dust is kept out; but the perforated medium is apt to become very soon clogged with dirt unless carefully attended to. Perhaps a better plan still, is that proposed by Mr. P. H. Bird (see SANITARY RECORD, Oct. 3, Nov. 14, 1874). It is simply to open the window by raising the lower sash and inserting a block of wood to close the space opened, and leave air to enter between the sashes at the middle of the window. At night, when the room is lighted up, a 'hopper' of calico is affixed to the lower half of the window and the lower sash raised behind it, the blind being drawn down to the level of the open window; in this way complete privacy is ensured, whilst the current of air is directed upwards towards the ceiling and distributed without draught. Of course, the window drapery requires to be so arranged as not to interfere with the free movement of air. According to the statement of the inventor, this plan (combined, it is true, with other openings) lowered the temperature of the room near the ceiling by about 15° Fahr.

b. Fireplaces.—The open fireplace in ordinary use in this country is of great value as a means of ventilation, and during cold weather is generally open and active; but when fires are no longer used, it is too frequently closed up, partly to prevent soot falling into the room and partly from fear of draughts. In bedrooms and cottages it is very often boarded up and pasted over carefully with paper. Under these circumstances the only ventilation possible is through the chinks of the doors and windows, which are generally kept shut. This is a very fatal error, and it would be infinitely better, should there be any draught, to put up a screen of some sort that would moderate it but still allow a free interchange of air to go on. In a case of gas-poisoning (reported by me in the *Lancet* in 1873), when I examined the state of the rooms occupied by the persons who perished, I found everything shut up as above described, and I feel convinced that the effects would in all probability not have been fatal had the fireplaces been left open so as to allow a free current of air to rush up the chimney. In most ordinary bedrooms the chimney forms a sufficient outlet (except where gas is burned), and, if left open, does not require to be supplemented by any other; for we have seen that an outlet opening of one-sixth of a square foot (or twenty-four square inches) is necessary for each individual; now, even a moderately sized chimney has about three times this sectional area. It is, however, not sufficient to provide only an outlet for the foul air, we must also furnish an inlet for fresh air. In warm weather this may be the ordinary outer air brought directly at most convenient points, such as the arrangements at windows before mentioned, or by special openings in the walls (to be presently considered). But in cold weather, which, after all, forms the bulk of the weather in this country, some provision must be made for warming the air before delivery into the room. For this purpose various plans have been suggested, both in this country and abroad, chiefly by means of ventilating-stoves, in which the air is warmed in a compartment round the fireplace and chimney before being thrown into the room. Captain Galton's grate has been extensively and successfully used; in this there is a chamber round the back of the grate, which is provided with radiating plates, and the chimney extending to the top of the room: cold air is brought in through a perforated brick in the outer wall, and warmed in the chamber from which it passes into the room through a louvred opening near the ceiling. Modifications of this can be easily arranged so as to have the openings in the room at or near the chimney-piece, or any other accessible point, to admit of the current of hot air being turned off or on at pleasure.

Another plan (which I had the opportunity of seeing in operation in the house of Mr. Jennings, the well-known sanitary engineer) consists in having a tube surrounding the chimney up to the top of the house, which tube opens into the room at the sides of the chimney block.* When the fire is lighted the air is sucked down this outer tube and delivered warmed into the room. In a large room some such arrangement is necessary, not only for ventilation but for warmth, as it is very difficult to warm a large

* This is in principle a modification of McKinnell's double-tube ventilator.

space properly by means of an ordinary open fireplace, the usual state of things being that those who are near the fireplace are burning whilst those at the other end of the room are freezing. I shall return to the question of warming a little later.

c. Special Ventilation Openings in Walls and Ceilings.—Hitherto I have spoken chiefly of ventilation carried on through such openings as are to be found in all rooms, but it has been shown that these are not always sufficient or convenient for the purpose. We must, however, have inlets for fresh air, and the question is how they are to be arranged so as to be most convenient. In most cases it is best to bring in fresh cold air at the upper part of a room in such a way as that it shall be thrown up towards the ceiling first, or so much divided as to obviate draughts. If it be brought in at the floor, or at any point on a level within the height of the occupant, a draught is certain to be established at some time, and the opening will be closed. The simplest and most convenient plan is the Sheringham valve, which can be had in various sizes. The opening into the room is a valve which can be opened or shut at pleasure by means of a cord. The air is brought in from without through one of Jenning's perforated bricks in the outer wall, and by the shape of the valve is thrown up towards the ceiling and then descends slowly into the room. In very cold weather it can be closed by pulling the cord, which may either be weighted at the end or attached to a nail or hook; when it is set free the valve falls open by its own weight.

Sheringham Valve.

Another plan is by Potts's ventilating cornice, through the open work of which the air can be delivered into the room by numerous channels and the effects of draught obviated. By this means a break in the wall is not necessary, as in the case of the Sheringham valve, which is a little unsightly in a sitting-room and sometimes objected to on that account.

In sitting-rooms, or in large rooms which are to be occupied by several persons, the chimney is not sufficient as an outlet, and a special outlet must be provided in addition. This is especially necessary in order to carry off the combustion-products where gas is in use, in which case an opening in the ceiling over the gas-burner is the best plan. This may be connected with a tube passing under the floor of the upper room and either going up round the chimney or passing up inside the chimney. In the latter case the tube should be carried right up the chimney, as otherwise smoke is almost sure to be sucked back occasionally into the room, and any arrangement of valves soon gets out of order from the accumulation of soot. Under any circumstances care should be taken to carry the outlet tube up the warmest part of the room, so as to ensure as continuous an uptake as possible.

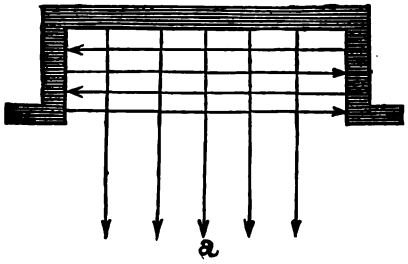
d. Warming of Dwellings.—This is a question so closely connected with ventilation that it is hardly possible to consider the two apart from one another, as no system of warming can be deemed a proper one that does not also provide for air-change at the same time. There are two main plans of warming, viz., by radiation and by convection; the former being carried on by open fires, the latter by air heated by some special contrivance. Convection is certainly the more economical method, but, as often practised, is certainly not the more wholesome. Let us consider first the use of open fireplaces. The advantages of these are; a most valuable outlet (often the only one) for foul air, a radiating surface which heats the body without over-heating the air or introducing any deleterious substance, and the cheerful and pleasing aspect of a bright fire. On the other hand the expense of this method is enormous in proportion to the heat utilised, for it has been calculated that with ordinary grates from 85 to 90 per cent of the heat is lost, and that, therefore, ten times as much is burnt as is really necessary. This was pointed out long ago by various observers, and notably by Count Rumford, but the improvement in the construction of grates is still only partial. The points to be attended to are: a chimney so constructed as to effect a thorough uptake and an arrangement of grate such as will ensure the most complete radiation into the room. When the sides of the fireplace are square or perpendicular to the wall a large amount of heat is lost; as the two sides reflect the heat against each other and finally up the chimney, but when they are slanted at a proper angle the heat is reflected into the room. This will be easily understood by a diagram of the two forms (*a* and *b*) in which the arrows indicate the direction of the rays of heat. The proportion of the back to the front of the grate proposed by Count Rumford was one-third, in which case the rays of heat from one side would always be parallel to the opposite side, and so never interfere with its radiation. In an old-fashioned square fireplace the insertion of a few bricks or a couple of iron plates will effect a very great improvement in the available quantity of heat to be obtained.* Another excellent plan is to bring the grate itself into the room, which may be done either by having a stove with an open fire-place at some distance from the wall of the room with a flue passing under the floor, or by merely advancing the grate itself a little beyond the level of the wall. The former is perhaps the better plan in very large rooms, but the latter (as in Galton's grate) is more adapted to small rooms; by it a great deal

* The point to be attended to is chiefly to have the sides so slanted that the rays of heat shall be sent into the room, and not against the opposite side of the fireplace. This may be accomplished if the angle of the side with the back be such that a line drawn from the angle itself at right angles to the side pass freely into the room without touching the opposite side. With a grate, like Count Rumford's, where the back is one-third of the front, the best results will be obtained when the depth (from before backwards) is not more than the width of the back, for then the line above mentioned will be parallel to the opposite side, and, if the fireplace be shallower, it will diverge; if, however, it be deeper, it will converge with a proportionate loss of radiation. Where a little more elaborate construction is admissible, the shape may be a segment of a large circle or of an ellipse, or it may be a parabolic or hyperbolic curve, any of which will accomplish the end in view. See diagrams (*c*, *d*, *e*, and *f*).

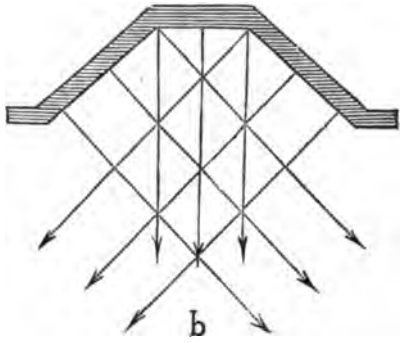
of heat is saved independently of the heated air-chamber already referred to.

The position of the fireplace is a matter of some importance with reference to the rest of the house. The most common plan with builders has been to put all the fireplaces of a house in the outside walls, by which means a large portion of their heat is wasted. By grouping them in the centre of the house much more heat is utilised, and the temperature of the interior kept more uniform. By the former method the hall or lobby is generally very cold unless there be a special stove for it, not always possible in small houses, whilst by the latter method any special heating apparatus for the hall may sometimes, indeed often be dispensed with.

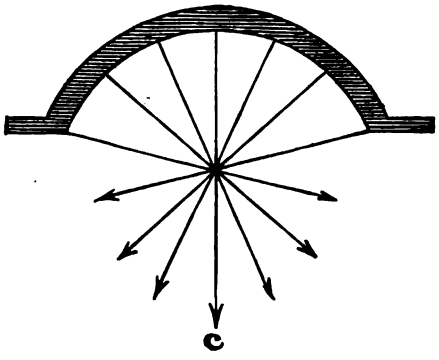
Heating by convection may be carried on by



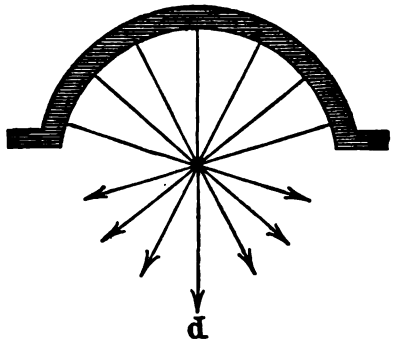
Square Fire-place—arrows showing direction of heat rays; side rays lost.



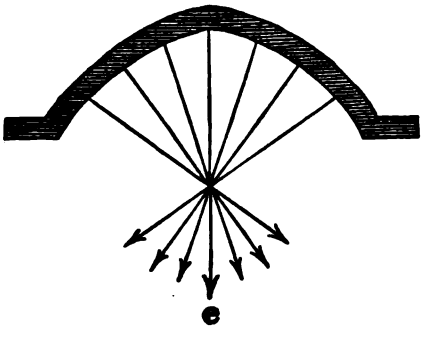
Fire-place with sloping sides—all the rays utilised.

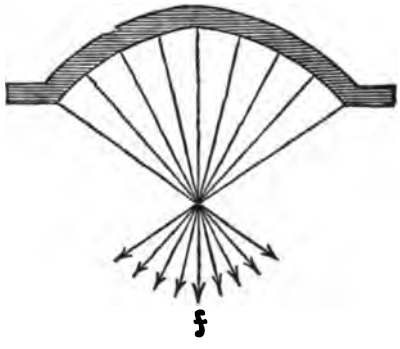


Fire-place—a segment of a circle.



Fire-place—a segment of an ellipse.





means of hot air delivered into the room from a special chamber; or by warming the air in the room itself by means of stoves or by pipes conveying hot water or steam. The first plan is exemplified on a small scale by Galton's air-chamber, and is much employed, with various modifications, in most large buildings. In the Houses of Parliament the air is brought through large louvred doors, and is screened from dust by passing through coarse muslin or tammy; it is then heated over steam pipes furnished with Gurney's radiating plates, and moistened by continual evaporation of water in special vessels, and finally delivered at a proper temperature, through openings in the floor of the House. Where proper precautions are taken this is an excellent plan. The objection to stoves is that they dry and burn the air too much. Undoubtedly this is the case if the stove is allowed to get too hot, a very unpleasant odour and

feeling being produced, perhaps owing to the scorching of organic matter. It is also proved that where cast-iron plates are overheated, the gaseous products of combustion, and notably the very poisonous gas carbonic oxide, may pass through them. Much may, however, be done to obviate these difficulties by proper arrangements, such as careful regulation and proper convection of the heat, and keeping up a supply of water to moisten the air. This is done very well in the case of the Gurney stoves by means of radiating plates, and a water-channel round the bottom. Gas-stoves, when provided with atmospheric burners so as to ensure complete combustion and a water-vessel for moistening the air, are very good, and from their small size are specially adapted for small houses. When pipes are employed they may be made to convey hot water or steam, the former being probably the more convenient and less expensive. A plan by which the warming apparatus is conveniently arranged within the wainscoting of the room has been made the subject of a patent by Messrs. Lankester, of Southampton. In places where boilers are much in use, as in manufacturing establishments and the like, waste steam can be used and as such is very economical. A general plan of heating has been proposed by Drs. Drysdale and Hayward, of Liverpool. This consists essentially in closing up all the openings in the house except the inlet for fresh air to the air-chamber and the outlet for the foul air shaft and the kitchen chimney. The hall is shut off from the outer air by a double door, so that the outer door may be opened without letting cold air into the house. Fresh air is brought in through a special opening to a chamber round the kitchen fire (or a special stove for the purpose) where it is warmed and then delivered into the hall and thence into the rooms. Special shafts from each room carry off the foul air into one main shaft, in which the uptake is assisted by the heat of a kitchen chimney, alongside which it passes up. According to the authors this plan works well, and no doubt the theory is good, if it be practicable. It would doubtless economise fuel to a large extent, and if it really does supply fresh air in sufficient quantity and carries off the foul air easily, it leaves little to be desired. At the same time it would be necessary to have means of opening the windows in case of anything going wrong with the ventilating arrangements, otherwise the inmates might run a risk of suffocation. On the whole we may say that although convection is good, it will be long before people will willingly resign the cheerful comfort of an open fireplace, but at the same time the latter need not be used in the unscientific and wasteful way which has hitherto been too much the rule. A combination of radiation and convection will be the best, and this may be applied to even small rooms by some of the methods referred to,—a fact well exemplified by the cottage grate recommended by Mr. Chadwick, which, like Galton's, is a modification of a plan proposed in the first half of the last century by Desaguliers.

AT Lambeth, J. Hawkins, was summoned for selling adulterated butter. Dr. Bernays said he had examined the butter, and doubted whether it was butter at all. It was adulterated with fat very largely, and, he believed, mixed with palm oil. There were large quantities of such mixture sold as 'butter.' The magistrate asked if the mixture sold as butter might be as good as butter? Dr. Bernays said it might be so. Fined 5*s.* and 12*s.* 6*d.* costs.

THE

SANITARY RECORD.

SATURDAY, AUGUST 14, 1875.

STREET CLEANSING AND WATERING.

IT is lamentable to ponder over the fact that in the matter of cleansing the mud from our streets, we are certainly far behind the knowledge of the age in which we live. It accumulates until it becomes a positive nuisance both to riders and pedestrians, in the one case gyrating from the dirty wheels on to the splash-board, and then off again upon the clothes, and in the other welling up around boots and trowsers. When the time comes for cleansing the roads, scavengers are set to work with rake and brush, and like a gang of mowers in a hay-field, one behind the other, they sweep the liquid dirt to the sides of the street. Or the very useful horse-sweeping machine may be used in its collection, by which the same work is more scientifically performed. Upon the scene then enters the liquid-dustman, who follows a deep cart, sometimes with high shirt-collars, as the deepening wings of the cart are called, and he shovels the watery mud as well as he can into the cart, and like a funeral mute follows it to the next slough of despond, the sludge oozing out of every joint of the side and tail-boards, and not unfrequently overflowing as the machine is jolted along. Once as full as it will carry, the cart is urged on at quick march to the *shoot*, some mile or two distant, and when emptied, returns to perform the same office until the streets are perfunctorily cleaned.

It is questionable whether or not in London the Thames might have been made the receptacle of all this mud, as in Paris, where the whole is conveyed in the sewers to the Seine, and the opinion of engineers points rather to the insufficiency of fall with us, and the excessive cost which such an arrangement would entail. But whatever may be argued upon this head, it cannot be doubtful, for one moment, that the present system of cleansing the streets of our large towns and cities partakes of extreme clumsiness, and is often a positive nuisance. We hail with pleasure then a recent suggestion, thrown out by Mr. Bayley, which is, the insertion in the roadways of iron tanks, into which early-rising scavengers should sweep the mud each morning, and night birds of the same earthy hue as regularly collect it on the following night. The tanks would be portable, and covered over with a hinged grating sufficiently strong to support the traffic over them. They would be collected by means of a travelling crane, and lifted bodily upon low trollies, which would then convey them to

the shoot, and either these or empty ones would replace them in the bricked-up pits. As the mud would in each case stand in the tank for some twelve hours or so, the heavy particles would subside to the bottom, and when the tank was lifted the clear portion of the wastes would be drawn off into the gullies, and ten per cent. of the load for conveyance thus eliminated. The scheme is certainly worth a fair trial. It would also prove of great value during a heavy snowfall, since all that would be necessary would be to sweep the snow into these tanks, add some suitable salts to facilitate melting, and then lift up and capsize the tank over the nearest street gully.

It is a matter of equal importance that our streets should be adequately watered during the season when the dust is most troublesome. We will not enter upon the subject as to whether such water should be mixed with deliquescent salts, so as to hold the dust in durance—that is not now the point. The question is rather, Which system of watering shall we adopt? Shall we import the Parisian method of watering by the hose system, and erect hydrants at every hundred yards in our main streets; or, shall we perpetuate the idea of using perforated pipes, laid into the line of curb-stone? If we adopt neither of these improved systems, we must retain the one we have—namely, the watering of the streets from the wooden carts, or iron hydrostatic vans.

It appears that the cost of introducing the French system would be 69*l.* per mile, and the cost of maintenance 86*l.* per mile. In like manner the cost of laying down the perforated pipes would be 832*l.* per mile, and the cost of maintenance 74*l.* per mile. As for the cost of the present system, using the most improved iron vans, that is 68*l.*, and the cost of maintenance about 42*l.* only. With these figures before us, we should have no difficulty in deciding upon the system we ought to adopt. It is a matter of fact, also, that the cheapest system is the best. For, when roads are furiously watered high-pressure fashion, from a hose, the macadamised roads are disintegrated, and their durability considerably reduced. And, when the perforated pipes are at play, the jets—during a wind act 'like a trundling mop at play'—frighten the horses, and delay the traffic by causing loitering.

THE STANDARD OF MILK.

IN spite of the number of times the question has been raised and the repeated answers it has received, some people still appear to be quite in the dark as to what rule is adopted by public analysts in estimating the adulteration of milk. Time after time it has been stated, on authority, that before the estimation of water is made, the milk is reckoned to have been originally of the poorest quality of ascertained pure milk, and that only on the excess of water over and above what would be present in such milk is a certificate of adulteration given or a prosecution instituted, and yet the hardship (?) of fining milk-dealers convicted of adding 10 per cent. of water to their milk continues to be denounced on such grounds as that 'Analysts cannot tell to 10 per cent.'; and 'Milk varies as much as 10 per cent.,' etc., etc.; whereas such pleas are entirely beside the question.

A correspondent of one of the morning papers has recently come forward, and, with the laudable intention of 'giving some little assistance to the magistrates' (and, if it were of any value, it ought to be very welcome to some of them), has imparted a discovery that he has made, namely, that while twenty-five gallons of one kind of milk will make a cheese of a certain weight, it will take thirty-six gallons of another kind of milk to make a cheese of a like weight. He has also discovered that some kinds of milk is three times as rich, for the purpose of butter-making, as others. The conclusion he draws is, that 'It is possible for perfectly pure milk to vary considerably above 20 per cent, and that our analysts, having fixed their standard from average milk, are perfectly ignorant of what injustice they cause when they condemn as adulterated all samples varying 10 per cent. from that standard.'

This statement is utterly untrue, as the analysts have *not* fixed their standard from 'average' but from the *poorest* milk; and this writer's premises are as false as his conclusions are unsound.

But it is well to point out once again, in the hope that the matter may be understood at last, that the cheese-yielding or the butter-yielding qualities of milk are not touched by the question of adulteration at all.

It is not a question whether a milk is capable of producing a certain proportion of cheese or butter, but whether the 'solids not fat' (that is to say, the total of all the solid constituents except butter), which is the only figure in a milk analysis that within very narrow limits is constant, falls below 9·0 per cent., as, however much the casein (or cheese-producing matter) or the sugar, or even the ash, vary in pure milk, their several variations almost equalise each other, and thus the 'solids not fat' as a rule remain constant.

It has hitherto been impossible to find a sample of milk which, when the analysis has been properly conducted, has been found to contain less than 9·0 per cent. of 'solids not fat,' and until such a sample is found, it is to be hoped that, in spite of all the outcry about 'injustice,' &c.—an outcry which has its root either in ignorance or dishonesty—the public analysts will not be deterred from doing their duty either by the wonderful discoveries of unscientific newspaper correspondents, or by the illogical reasoning of bigoted magistrates.

IT is reported that the Local Government Board have appointed a commission to inspect the various sewage works. The members of the commission are Mr. Smith, Mr. Rawlingson, and Mr. Reade, M.P.

Notes of the Week.

TEMPERANCE DRINKS.

A LAUDABLE attempt to provide a counter-attraction to the public-house has been made by the Church of England Temperance Society, by establishing in the poor districts of London street-stalls for the supply of temperance drinks and light refreshments, suited for the varying seasons. The stalls for the sale of these refreshments are light and neat in appearance, easily moved on wheels from place to place, and are said not to cost more than 20*l.* each. The great want appears to be an awning or shelter for the use of customers in unseasonable weather. This, however, could no doubt be easily remedied.

COLONEL JONES' SEWAGE FARM.

MR. CLARE S. READ, M.P. (Parliamentary Secretary), and a committee, appointed by the Local Government Board to examine and report upon the several modes of treating town-sewage, inspected the sewage farm at Wrexham on the 11th inst., and appeared much pleased with the growing crops of Italian rye-grass, mangolds, etc., etc., in course of irrigation.

They also looked into the accounts of the farm, which are minutely recorded, with a view to solving the important question—will a sewage-farm pay? having those relating to the last year 1874-5 laid before them, as well as the information already published on this point, which is the *spécialité* of the farm in question.

THE HEALTH OF KENSINGTON.

DR. T. O. DUDFIELD, the medical officer of health for Kensington, states in his usual monthly report that a great deal of unnecessary alarm is prevailing on account of scarlet fever. The disease does exist there in common with many other parts of the metropolis; but it has not yet assumed a severe form. He is acquainted with several cases of scarlet fever in South Kensington, some of which have arisen under peculiar circumstances that are now undergoing a rigorous investigation. So far no death has occurred; and, although nearly three weeks have elapsed, the disease is not known to have spread from any of the original sufferers to any other persons.

Dr. Dudfield reminds the Vestry that he has no power to compel disclosure of infectious disease, and that it is only when death has occurred that he is made aware of the existence of the disease. It is of course most desirable that a system of compulsory registration of disease should be inaugurated, and the sooner the better.

SANITARY SUGGESTIONS.

A REPORT recently issued by the public health committee of the corporation of Dublin relative to a nuisance arising from an overcrowded and filthy dairy-yard having been brought under the notice of the council of the Dublin Sanitary Association, it was resolved:

1. That this committee is of opinion that the keeping of cattle in such a locality is of itself a nuisance, and injurious to health within the meaning of s. 8 of 18 & 19 Vict., c. 121 (Public Health Act, 1866).

2. That the expressions 'fairly clean condition' and 'cleanly,' cannot be applied to the state of things described in the report.

3. That it is desirable that the keeping of cattle in the proximity of a hospital, or other inhabited building, should at once be prohibited.

4. That this prohibition is especially called for in the case of a hospital, the inmates of which are necessarily in a low state of health, and, therefore, unable to resist the inroads of preventable disease.

INFECTIOUS DISEASES AMONG THE POOR.

THE sanitary authorities of St. Luke's, in their recent report, instanced several cases in which it was discovered that persons suffering from infectious diseases were employed in the manufacture of clothing. This is an incident of somewhat frequent occurrence in St. Luke's, and in fact of all overcrowded and very poor districts. The inspector who made the report, however, made a sensible suggestion that whilst this sort of thing should be stopped in a summary manner, some means should be adopted whereby the people might be compensated for the loss of their occupation. The adoption of this advice would, we believe, be a sound liberal policy. It is hard that industrious workpeople should be overtaken by pauperism through unavoidable temporary illness. Though of course they should not be allowed to spread infection in their laudable anxiety to earn a living.

OVERCROWDING IN THE BLACK COUNTRY.

AT the ordinary monthly meeting of the Darlaston local board on the 3rd inst., a case of overcrowding was reported by a nuisance inspector, which was, it is to be hoped, of an entirely exceptional character. It appears that there is a small house in Crown Yard which contains 'only one room and a closet upstairs,' and is, or was at that time, occupied by a man, his wife, seven children, and one lodger. It was added 'fowls were also kept in the house.' An order was, of course, issued for the abatement of the nuisance. The marked improvement which has recently been conspicuous in the health of the Black Country is in great measure due to the measures which have been taken to discover and to put down gross and dangerous cases of overcrowding such as the one above mentioned, which was reported to the Darlaston local board. At the same meeting of the board the medical officer of health furnished his report upon the mortality of the district during July, which was at the annual rate of 21·2 per 1,000. Although the death-rate from all causes was not excessive, the facts that 65 per cent. were of children under five years of age, and that 20 per cent. were due to zymotic diseases, appear to us scarcely to support the medical officer's opinion that the town is in a 'fairly healthy condition,' or the conclusion of the board that the report was 'very satisfactory.' It is perfectly true that the present health of Darlaston, as well as of other parts of Staffordshire, may be favourably compared with what it was some little time since, but it may be hoped that its urban sanitary authority will not hastily conclude that they have already arrived at that stage of their sanitary labours which entitles them to rest and be thankful.

KINGSTON-ON-THAMES AND ITS SEWAGE.

THE completion of the metropolitan main-drainage system by the recent opening of the Pimlico pumping station, which diverts the last portion of the metropolitan sewage from the Thames, near London, and carries it with the rest, a distance of fourteen miles down the river, invests with additional value any information bearing upon the sewage of the Thames valley. The river which Londoners have paid more than four millions sterling to purify at London is still poisoned by the sewage of a large population living above London. It is stated that the Corporation of Kingston-on-Thames have accepted the contract of the Native Guano Company (Limited) to dispose of the town drainage and sewage in such a manner as shall secure the complete satisfaction of the Thames conservators. This, of course, signifies that the Native Guano Company undertake to deal with the sewage in such a manner as to secure the effluent water being equal to the standard of purity fixed upon by the conservators. The annual subsidy of one penny in the pound on the rateable value of the borough, which the Kingston Corporation has undertaken to pay to the company, is dependent upon the quality of the effluent water satisfying the

conservators. The company's operations are to be carried on just below Kingston Bridge, and the Corporation reserves to itself the right, under certain circumstances, of purchasing the works. The Kingston Corporation appear to have made a very good bargain, and we shall be very glad to hear that the company is able to make a profit out of the speculation. The difficulties of sewage disposal will then seem nearer a solution than they do at present.

There still remains, however, a number of tributary streams which receive and discharge into the Thames the sewage of the towns through which they flow. The Mole, for instance, receives the greater part of the sewage from Guildford and Godalming. These tributaries will have to be dealt with in a decisive manner.

DEATH-RATES IN AND AROUND TOWNS.

AT the last meeting of the Statistical Society on the 15th inst., a paper was read by Mr. Thomas A. Welton, 'On the Effect of Migrations upon Death-rates.' It will be remembered that this effect of migration upon rates of mortality was one of the grounds upon which Dr. Letheby some little time since, in his remarkable address to the Society of Officers of Health, urged that general death-rates, as published by the Registrar-General, were utterly fallacious, and mischievously delusive. Mr. Welton has before now devoted much time to the study of this subject, and has directed attention to the fact that the death-rates in town populations among males aged from ten to twenty-five years, and among females aged between ten and thirty-five years, are considerably lower than in the populations living outside the towns, or in the whole population of England and Wales. He also draws especial notice to the far greater fatality of phthisis at these ages, outside towns than within them, especially among females. These are undoubted facts, and have been frequently alluded to in the publications of the Registrar-General, but Mr. Walton, in his original paper on the subject, as well as in the paper read the other night, has handled the subject both carefully and laboriously, and has thus furnished a valuable contribution to this branch of vital statistics. It is only when Mr. Welton attempts to account for the low death-rates at these ages in towns, while at all other ages the town rates show a large excess, that he gets on to controversial ground; he urges that this low death-rate is caused by the large number of immigrants into towns, who when attacked by phthisis, or other chronic disease, return to their native homes to die. Unfortunately this assertion, although entirely reasonable, cannot be proved, and it has been urged on the other side that the low death-rates at these ages is also in great measure due to the fact that the immigrants are all what may be called 'selected' lives, who during their first few years of town residence enjoy better health, even than the remainder of their families in their rural homes. It has moreover been suggested that the young persons who in towns survive the high rate of infant mortality which prevails, are the strongest and most robust, and during the later years of childhood and the earlier years of manhood, are liable to a low death-rate. The discussion following the paper was maintained by Dr. W. Farr, Dr. Letheby, Dr. Mowatt, and others. Mr. N. A. Humphreys showed how very small the effect upon the general death-rate would be, even assuming that but for this disturbing element the death-rates in towns, at these ages, would exceed those outside towns as much as at other ages; he asserts that if all the deaths at these ages which Mr. Welton says occur outside London from this cause were debited to London, the only effect would be to raise the general death-rate at all ages in the metropolis 0·4 per 1,000. We need not therefore on this account discard the use of general death-rates, but we can cordially recommend this paper, and the subject it discusses, to the attention of medical officers of health.

UNWHOLESOME FOUNDATIONS.

SOME time since Mr. Alderman Bennett, of Liverpool, drew prominent attention to the very objectionable and dangerous practice which prevailed in that town of carting street sweepings, ashpit offal, the straw from fever beds, and other objectionable refuse containing organic matter on the ground which would eventually be built upon. Of such a nature was this refuse that Mr. Bennett states that he has seen it at times on fire from spontaneous combustion. This subject has been the cause of an ancient contention between Mr. Bennett and many of his brother aldermen and councillors, so much so that in 1873 Mr. Bennett resigned his seat, but was re-elected in 1875, when, failing any other redress, he very properly brought the subject before the notice of the Local Government Board. A prophet has no honour in his own country, and the alderman appears to have raised a hornet's nest about his ears, judging from the correspondence we have seen. We trust, however, that Mr. Bennett will not be deterred from persevering in the course he has taken. The evils arising from a foundation of filth and refuse are more numerous and general than most people are aware of in all large towns.

We have constantly drawn attention to this subject in our columns, but apparently with little effect, judging from the case of *Allen* v. *Martin*, which is generally known as the Euston Square case. In this case the defendant Martin had contracted to raise the level of the Euston Square Gardens, lay them out, and improve them generally. The first step was to cart away all the gravelly subsoil and fill it up with dustbin refuse, which caused a great nuisance and was injurious to health, whilst he made a large surreptitious profit from the sale of gravel. An injunction was obtained, after this had been going on for some time, to restrain Mr. Martin, but this appears to have been set at defiance until an application was made to commit the defendant to prison for contempt, when a medical certificate was put in. The illness was, no doubt, a genuine and a painful one, though it occurred opportunely to prevent Mr. Martin from receiving a well-deserved reprimand in addition to the order for committal which the Vice-Chancellor granted, and an order to pay all costs. This, however, does not undo the mischief which has been perpetrated. The garden has been left in a state of desolation, with a festering subsoil of ashpit and organic refuse.

Bad as this case is, there is the palliation that the gardens in question are not, and probably never will be, used as a building site, and the vegetation might, and doubtless will, in time render the subsoil innocuous. Where the ground on which such deposits are made is eventually used for a building site the evil becomes one of the gravest nature; yet it is an evil which exists in the suburbs and centres of all large towns. The particular part of Liverpool which Mr. Bennett has notified is named Kensington. We have called attention ere now to Kensington, London, where in the district known as the Potteries, unsanitary foundations are not uncommon.

It would be well if every town and district had an Alderman Bennett to do battle against this most subtle and dangerous cause of illness. He has our hearty sympathy in the cause he has taken up.

THE HEALTH OF REDRUTH.

THE fatal prevalence of scarlet fever in Redruth has recently attracted considerable local attention, and it may, therefore, be useful briefly to consider the recent vital statistics of this Cornish town with a view to estimate its sanitary condition. The local board district of Redruth is co-extensive with the parish and registration sub-district of the same name. The population of the district, which had been 11,504 in 1861, declined to 10,685 in 1871. It may be estimated that the population of the town and district has remained stationary since 1871 at the 10,685 persons then enumerated.

During the ten years 1861–70 the average annual number of births in Redruth sub-district were 391, and of deaths 233, equal to annual rates of 35·2 and 21·0 per

1,000. In 1873 and 1874 the births registered were 322 and 338 respectively, which may be taken as evidence that it will not be far wrong to assume that the population has been stationary since 1871.

Before considering the death-rate in the sub-district, with the view of comparing it with other death-rates, it should be stated that the union workhouse is situated in the Illogan sub-district, and that it is necessary to correct the death-rate in the Redruth sub-district by the addition of the deaths in the workhouse of paupers admitted to that institution from Redruth. During the four years 1871–74 the proportion of deaths in the workhouse to the total deaths in the union was, as nearly as possible, 3 per cent. After adding 3 per cent. to the deaths registered in Redruth as a correction for the share of the workhouse deaths belonging to the town, the average annual death-rate of the sub-district during the ten years 1861-70 becomes 21·6 per 1,000. In the first four years of the current decade, 1871-74, the death-rate has been, after a similar correction for deaths in the workhouse, equal to 18·2, 18·2, 19·5, and 21·2 per 1,000. In the first six months of this year the death-rate has further increased to 23·8. According to the Registrar General's Quarterly Return, two fatal cases of scarlet fever were recorded in the local board district in the first quarter, and sixteen in the second of this year. The annual death-rate from scarlet fever during the three months ending June 30 last was equal to 6 per 1,000 of the population in Redruth, whereas in the whole of England and Wales it averaged only 0·7 per 1,000, and in the eighteen largest English towns it was also less than 1 per 1,000.

This degree of fatality from a zymotic disease may usually be accepted as conclusive evidence of unsatisfactory sanitary condition, which is more easily reduced in a town like Redruth, with a stationary if not a declining population, than in those towns in which a rapidly increasing population render overcrowding excessively difficult to deal with.

It may be stated that during the year 1874 the death-rate from the seven principal zymotic diseases did not exceed 2·2 per 1,000, which is low for a town population; and the proportion to total deaths was not more than 10·5 per cent. In 1873 the zymotic rate was 2·7 per 1,000, and the percentage of deaths from these diseases 14. It appears, therefore, that until the present outbreak of scarlet fever the zymotic death-rate in Redruth had recently been satisfactorily low. The steady increase of the death-rate from all causes in the town in recent years, and the exceptional fatality of the scarlet fever epidemic, may not, however, engage the attention of the local authorities, and indeed of all those interested in the sanitary welfare of the town. A careful investigation will doubtlessly reveal several sanitary shortcomings, which, if promptly dealt with, will cause the present epidemic to be regarded in the future as the indirect cause of an improved sanitary condition of the population. The localities in which the recent deaths from scarlet fever have occurred will probably be found to be those which stand most in need of sanitary improvement. Such is the usual experience of epidemics.

THE DUBLIN SANITARY ASSOCIATION.

ON July 17 we published a report of the third annual meeting of the Dublin Sanitary Association. We have now before us a copy of the report of the executive committee presented to that meeting, together with various appendices upon sanitary matters in Dublin. This association was founded about four years ago, with the following objects:

1. To create an educated public opinion with regard to sanitary matters in general.

2. To direct the attention of the authorities and the public to those points in which the existing powers for the maintenance of the sanitary condition of the city are either not duly exercised or are inadequate, or in which the machinery at the disposal of the sanitary authorities is insufficient.

3. To watch the course of sanitary legislation on behalf of the public.

4. To form a body in which the public may have confidence, and through which they may, if necessary, act.

The association, though not very numerous in members, contains, among its supporters, nearly all the leading citizens of Dublin, together with Parliamentary representatives of the county, city, and university, the Presidents of the Colleges of Physicians and Surgeons, and many names well known in the social and political world. The association has had uphill work in carrying out its objects. With a view of diffusing sanitary knowledge lectures have been delivered. One course of lectures was organised in conjunction with the Royal Dublin Society; the lectures were delivered by a number of well-known Dublin sanitarians, and have done much to encourage a study of sanitary science among the better educated classes. These lectures have since been published, and already been noticed favourably by us and our contemporaries. The association has during the past season attempted successfully a less ambitious but probably not less useful method of instruction; that is, by popular lectures on sanitary subjects of an elementary character, delivered by persons capable of giving the highest class of sanitary instruction. The lectures were delivered in a schoolroom kindly lent for the purpose. The audiences were large and attentive, and steadily increased in numbers as the course advanced. The subjects were—Sanitary Science, and its Relation to the Prevention of Disease; House Accommodation; Contagion and Disinfection; Air; Water; Climate, and its Relation to Health and Clothing; Sanitary Administration. We understand applications have been made to the association for similar courses of lectures in other parts of the city and suburbs, and that the committee is likely to find a difficulty in supplying the demand for sanitary knowledge. The second object of the association has not met with such encouraging results, the most important of the Dublin sanitary authorities, — namely, the city Corporation— having set itself deliberately to obstruct the action of the society, and having had the incivility to neglect to notice 129 out of 347 communications addressed to it by the association, and the audacity to deny that there was cause for thirty of the complaints made by members of the committee. As we know the persons who made these complaints, and are aware that their authority is unimpeachable, we think the necessity for the society sticking fast to its second object is fully proved by the ignorant obstructiveness of the city authorities. The society has done good work in its third department; and judging by the amount of labour expended by some of the members of the committee last year during the passage of the Irish Public Health Bill, we think 'watching legislation' a very mild term to apply to the work done by the society under this head. The marks of the Dublin Sanitary Association are beneficially impressed on many sections of the Irish Public Health Act, and we believe the Government has good cause to be thankful for the aid given by the association in moulding the bill. The association was also instrumental in having the Artisans' Dwellings Bill of the present session extended to Ireland. The committee of the society have also called the attention of the Local Government Board to many defects in the sanitary administration of the city. We are glad to say the association has the unanimous support of the Dublin press, and is only disliked by the so-called sanitary authority. Why should not every large town, aye, and even rural district, have its sanitary association? We know of no place where sanitary improvements are not required. All towns may not be burdened with such lethargic authorities as Dublin; but there are many 'urban and rural' authorities requiring sanitary stimulation. Where there are active authorities they will be glad of the aid of a sanitary association, not merely to assist in detecting sanitary defects, but to teach the people the value of sanitary improvements, and thereby

support, encourage, and if necessary stimulate the authorities themselves. We wish every success to the Dublin Sanitary Association, and trust that its work may be so effectual that year by year the necessity for its existence may steadily decrease.

The Health of Watering Places.

IX.—FOLKESTONE.

THE boundaries of the municipal borough, of the township, and of the parish of Folkestone only differ sufficiently to prevent their being identical. According to the census report for 1871, the population of the township enumerated in that year was 11,304; of the borough, 12,698; and of the parish, 12,951. This confusion of local boundaries, which is unfortunately far from being confined to Folkestone, is much to be regretted, and adds very materially to the difficulty of compiling trustworthy and satisfactory vital statistics. We shall moreover presently find that the registration sub-district of Folkestone is again another and a larger area known and spoken of by the same name.

In briefly alluding to the rise and growth of Folkestone, we shall confine ourselves to the consideration of the population of the ancient parish of that name, which at the first national census in 1801 contained but 3,257 inhabitants. Between 1801 and 1841 the increase of population was very small, and did not exceed 14·3 per cent. in the forty years, the number enumerated in 1841 being 3,723. During the next decade, however, the completion of the South-Eastern railway was the commencement of a period of rapid increase, and by 1851 the population had risen to 6,726, equal to 80·7 per cent. in the ten years. In 1861 the population had further increased to 9,678, and equal to 43·9 per cent. Between 1861 and 1871, although the rate of increase further declined, it was equal to 33·8 per cent., 12,951 persons being enumerated within the parish in the latter year. If we assume that the rate of increase of population which prevailed between 1861 and 1871 has since been maintained, the population of the mupicipal borough of Folkestone in the middle of the present year may be estimated at 14,407.

As the town council constitutes the urban sanitary authority for Folkestone, the boundaries of the borough would be those which we should prefer to deal with, but vital statistics for the borough are not available for a series of years, and it will be necessary for this purpose to use the boundaries of the registration sub-district of Folkestone, which is adopted by the Registrar General in his annual watering-place table. It will be desirable, therefore, to explain the extent to which the constitution of the sub-district differs from that of the borough. The sub-district includes, in addition to the borough, a small extra-municipal portion of Folkestone parish, containing in 1871 a population of 253 persons; the parish of Hawkinge, with 129 persons, and the parish of Chinton, which in 1871 contained a population of 6,504 persons, including 3,101 soldiers, etc., in Shorncliffe camp. The inclusion of this extra-municipal population of 6,886 persons in the sub-district of Folkestone is not without its effect upon the rate of mortality for the sub-district, as published in the Registrar General's watering-place table. With regard to the military population of about 3,000, consisting principally of adults at those ages when the average rate of mortality is low, the effect of its inclusion in the sub-district ought undoubtedly to lower the death-rate. We should not, however, expect to find any appreciable effect produced by the situation of Sandgate within the sub-district. The annual rate of mortality in Folkestone sub-district during 1874 was equal to 16·3 per 1,000, whereas in the borough it was 17·4. So far as 1874 was concerned, the rate of mortality in Folkestone sub-district (including Shorncliffe Camp) was 1·1 per 1,000 lower than the rate in the borough. Both these rates, however, are under-stated, as the Union workhouse of Elham is situated outside the sub-district of Folkestone; the deaths of paupers admitted both from the borough and sub-district of Folkestone are there registered. We shall have further occasion to refer to the necessary correction for these workhouse deaths, which in 1874 were equal to 5·8 per cent. of the deaths registered in the district of Elham. This proportion of workhouse deaths was considerably lower than that which prevailed in the neighbouring union of Dover.

Before proceeding to analyse the mortality returns for the borough of Folkestone in 1874, it will be well briefly to refer to the recently recorded birth-rate, in order to afford the means for judging of the approximate accuracy of the estimate of the present population of the borough. During the ten years 1861-70 the average annual birth-rate in the registration sub-district of Folkestone was 29·9 per 1,000; whereas in the four years 1871-4 the birth-rate calculated upon the estimated population has been successively 32·2, 31·7, 28·9, and 31·3. Thus the birth-rate has averaged 31·0 during the past four years, against 29·9 in the preceding ten years. It may, therefore, be safely assumed that the population of the sub-district, and as a natural consequence of the borough, is not over-estimated. It is, indeed, possible that the rate of increase of population since 1871 has exceeded that which prevailed during the ten years 1861 and 1871, in which case the estimate adopted may be somewhat understated. It is useful to ascertain, from year to year, the number of inhabited houses within boundaries for which estimates of population are required; this information supplies the means for checking any serious discrepancy in the estimate, and shows when it is desirable to depart from the usual method for its calculation. Should the estimate for Folkestone be slightly under-estimated, the effect would be somewhat to over-state both the birth and death rates for the sub-district and borough. The error, however, if any, is so small that it can scarcely affect the calculated rates.

Figures relating to the mortality in the borough of Folkestone during a series of recent years are not available; it is possible, however, to obtain from the publications of the Registrar General the means for calculating the rate of mortality in the sub-district, which gives a fair indication of the death-rate in the borough, notwithstanding the inclusion of Shorncliffe Camp within the sub-district. The annual rate of mortality in the sub-district during the ten years 1861–70 averaged 17·4 per 1,000, and in the four past years of the current decade 1871–4 the death-rate has been 21·4, 14·7, 14·6, and 17·2 per 1,000 respectively. Thus during the past four years the death-rate has averaged 17·0 per 1,000, and has been 0·4 below the average rate in the preceding ten years. These rates of mortality in the sub-district have been corrected for the deaths in the Union Workhouse at Elham of paupers admitted from Folkestone sub-district. This correction has been made by raising the deaths in the sub-district during the several periods by 5·8 per cent., which, as before stated, was the proportion of workhouse deaths to total deaths in the Union during the year 1874.

We will now proceed to analyse the recorded mortality of the borough of Folkestone during 1874. The deaths registered in the year were 243, which after being increased by 5·8 per cent., in order to add the due proportion of the workhouse deaths, were equal to a rate of mortality of 18·4 per 1,000. This rate exceeded by 1·2 per 1,000 the rate for the year in the sub-district, after a similar correction for deaths in the workhouse.

The 243 deaths registered within the borough included fifteen which were referred to diarrhœa, nine to whooping-cough, three to measles, two to scarlatina, two to diphtheria, two to fever, and not one to small-pox; in all thirty-three deaths resulted from these seven principal zymotic diseases, showing a proportion of 13·6 per cent. of the deaths from all causes, and a rate of 2·4 per 1,000 persons estimated to be living. The percentage to total deaths of those referred to the principal zymotic diseases

during 1874 in the watering places previously noticed ranged from six and ten in Eastbourne and Ramsgate, to eighteen and twenty-nine in Lowestoft and Yarmouth. The zymotic rate to a 1,000 of the population in these places was, as we have seen, 2·4 in Folkestone during 1874, whereas it was but 0·9 and 1·5 in Eastbourne and Ramsgate, and ranged upwards to 2·9 and 6·4 in Lowestoft and Yarmouth. In the ex-municipal portion of Folkestone sub-district, which includes the Camp and part of Sandgate, the zymotic death-rate was equal to 1·6 per 1,000 in 1874 instead of 2·4 in the borough, although in the latter part of the year the proportion of deaths from these diseases occurring among soldiers' children in the Camp was somewhat excessive.

With regard to the deaths referred to zymotic diseases within Folkestone borough during 1874, it may be noted that four fatal cases of whooping-cough occurred in the first, three in the second, and one each in the last two quarters of the year; of the three deaths from measles two occurred in the June quarter, as did both those from fever; and both those from scarlatina in the last three months of the year. With regard to the fatal cases of diarrhœa, two occurred in the June, seven in the September, and five in the December quarters. Of the two deaths from fever, one was certified as typhoid in Guildhall Street, and the other as simple continued in Sandy Lane; in his annual report for 1874, the medical officer of health for the borough, however, alludes to the Sandy Lane case as one of typhoid fever, and speaks of this neighbourhood as 'sadly deficient both in drainage and water-supply.' No particulars are given in this report as to the case in Guildhall Street. During the third or summer quarter of the year the annual death-rate from diarrhœa in Folkestone borough was equal to 2·0 per 1,000; all the seven fatal cases were of children under five years of age, including five of infants under one year of age. In Eastbourne, no death from diarrhœa was registered during the summer quarter of 1874, whereas the death-rate from diarrhœa in the other watering places during these three months ranged from 1·2 in Hastings to 4·9 in Margate. Very little appears to be known as to the conditions which cause the wide variation in the fatality from diarrhœa, which may be observed in different populations. As more than 80 per cent. of the deaths from diarrhœa are of infants under one year of age it might be expected that the death-rates from diarrhœa would relatively correspond with the rates of infant mortality from all causes. This, however, is not always found to be the case. In Eastbourne, for instance, no deaths were referred to diarrhœa during the summer quarter of 1874, and yet the rate of infant mortality from all causes during the whole year was excessive.

Before quitting the subject of the deaths from zymotic diseases in Folkestone during 1874, it will be well to mention an outbreak of puerperal fever which occurred within the borough in April. On April 9 two deaths were referred to this disease in London Street and Cambridge Terrace, and two others occurred in different houses in Ford Road on the 13th and 17th of the same month. These four deaths could probably be traced to one source of contagion, communicated either by the medical attendant or the nurse. Since the new Registration Act came into operation, on 1st January last, the death-register affords the means for ascertaining the names of the medical attendants who certify the causes of death; this information will, in future, enable medical officers of health to trace the origin of outbreaks of puerperal fever, and to ascertain whether proper precautions have been taken to prevent the spread of the disease.

Measured by the proportion of deaths of infants under one year to births registered, the rate of infant mortality in Folkestone borough in 1874 was equal to 121 per 1,000. The proportion of infant mortality, estimated in this manner, in the eight other English watering places previously noticed ranged from 113 and 126 in Ramsgate and Dover, to 154 and 158 in Yarmouth and Lowestoft. The fifty-four deaths of infants under one year of age in Folkestone borough last year included twelve from zymotic diseases, four from scrofulous diseases, six from diseases of the respiratory organs, six from premature birth, and eighteen from the somewhat indefinite causes—convulsions, atrophy, and debility.

At the census enumeration in 1871, the 19,584 residents in Folkestone sub-district included 1,035, or 5·28 per cent., of persons aged sixty years and upwards. This proportion was considerably lower than that which was observed in the other watering places; this was, probably, due in great measure to the disturbing influence of the soldiers in Shorncliffe Camp. Assuming that the proportion of persons aged upwards of sixty years in Folkestone sub-district was the same in the middle of 1874 as it was in 1871, their number may be estimated at 1,075, and the sixty-seven deaths of persons aged above sixty years registered during the year were equal to a rate of 62·3 per 1,000. This death-rate among persons aged sixty years and upwards in 1874 was equal to 72·0 per 1,000 in the whole of England and Wales, and in the eight different watering places previously referred to it ranged from 56·6 in Lowestoft to 67·1 in Eastbourne.

As in the case of the watering places previously discussed, it may be useful briefly to consider the rate of mortality in Folkestone from diseases of the respiratory organs and phthisis during 1874. Within the borough, thirty-three deaths were referred to diseases of the respiratory organs and twenty to phthisis, equal to 2·4 and 1·4 per 1,000 of the population respectively. The death-rate from diseases of the respiratory organs, including bronchitis, pneumonia, asthma, pleurisy, etc., in 1874 was equal to 2·4 in Lowestoft, 2·6 in Eastbourne, and 3·6 in Dover. The phthisis rate in 1874 was 1·3 per 1,000 in Lowestoft, and 1·8 both in Eastbourne and Dover. We may refer to the fact that in Hastings the death-rate in 1874 from diseases of the respiratory organs was 3·1, and from phthisis 2·6 per 1,000. These excessive rates in Hastings are, however, probably due to the fact of this watering place being a favourite winter resort for invalids in general, and especially for phthisical patients. We are not aware, however, that the value of the above comparison between the death-rates from these diseases in Lowestoft, Dover, Eastbourne and Folkestone is to any considerable extent disturbed by the deaths of visitors, and believe that the above figures fairly represent the proportional fatality from these causes among the resident populations of the four watering places.

With regard to the more recent mortality statistics for Folkestone, we are entirely dependent upon the figures contained in the quarterly returns of the Registrar General relating to the quarters ending March and June last. These refer to the entire sub-district, including Shorncliffe Camp, and are therefore somewhat more favourable than the figures for the borough would be. During the first six months of 1875 there were 213 deaths registered in Folkestone sub-district, which were, after correction for deaths in the workhouse, equal to an annual rate of 22·5 per 1,000. In the corresponding six months of 1874 the deaths in the sub-district did not exceed 160. To the seven principal zymotic diseases, twenty-seven deaths were referred in the first half of this year, against eighteen in the same period of 1874; of these twenty-seven deaths, twenty-two resulted from measles, two from fever, two from diarrhœa, and one from small-pox. The fatal case of small-pox was of an infant brought from Canterbury; the twenty-two of measles included seven in the first and fifteen in the second quarter of the year. This considerable increase in the recent death-rate in Folkestone, and the fatal epidemic of measles, suggest most forcibly that the sanitary condition of some parts of the town is not what its best friends would wish it to be.

In conclusion, a word or two on the general condition of the borough may not be out of place. The sewerage system is on the whole satisfactory, and the sewage is conveyed through stoneware glazed pipes, which have for the most part good gradients, into the sea some distance east

of the town. In the upper parts of the town the sewers are efficiently ventilated through gullies which are trapped by means of charcoal trays. In the lower parts of the town, however, the ventilation of the sewers is far from satisfactory, and sewer gas is driven through the houses into the atmosphere to a dangerous extent. The difficulties in the way of properly ventilating sewers which have a tidal outfall, and are at times tide-locked, require to be dealt with on scientific principles, or else the result will necessarily arise which may so often be noticed in the older and low-lying parts of the borough, where sewer gas undoubtedly permeates the atmosphere. The water-supply of Folkestone is of wholesome quality, derived from springs and wells at the base of Cæsar's Hill, at a distance of about two miles from the borough. The water is, however, excessively hard, and is only delivered on the intermittent system; the quantity, moreover, which is supplied to the inhabitants is at times but scanty. The water service of Folkestone is now in the hands of a public company, but unless some arrangement could be made for softening the water-supply of the town, and furnishing it on the constant system, the sooner the Town Council of Folkestone follows the example of other towns, and takes the water-supply into its own hands, the better it will be for the health and comfort of inhabitants. Some parts of the town are still supplied from shallow wells, the water of which is open to grave suspicion, and the medical officer of health for the borough called attention to this fact with reference to a fatal case of fever which occurred in one of these neighbourhoods in 1874. Certain parts of the town, moreover, to which probably Lord Robert Montague referred when he spoke of its 'fever-nests,' are undoubtedly ill-paved, ill-ventilated, close, and confined. Unless measures could be taken to improve the structural condition of these parts of the town, it is at least important that their health should be carefully watched, their scavenging constantly attended to, and their disinfection not neglected. These localities do not frequently come under the eyes of visitors, but local authorities will do well to bear continually in mind that the health of a town depends much more upon the condition of its worst parts than upon that of the leading thoroughfares and best neighbourhoods. Fever and other zymotic diseases are mostly generated in nooks and corners of towns, which are perhaps out of sight, and hidden away from public view. Lastly, let us briefly call attention to the fact that the town council as the sanitary authority for the town incurs a grave responsibility by having so long neglected to provide hospital accommodation for the isolation and treatment of cases of infectious disease, without which a watering place runs serious risks of suffering from epidemics. We believe that some time since a site for such a hospital was purchased, but was objected to by an inspector from the Local Government Board. Whatever the grounds of these objections may have been, the town council can hardly on this account be exonerated from providing such accommodation, which in watering places is an absolute necessity, on account of the risks they run from the importation of cases of zymotic disease. The attention which has recently been so publicly directed to the health of Folkestone may be turned to most useful account if the authorities earnestly set about redressing the few blemishes which detract from the generally satisfactory condition of this favourite watering place. So long, however, as their medical officer of health is able to point out to his sanitary authority that parts of the borough are 'sadly deficient both in drainage and water-supply,' the best interests of the town are being sacrificed to a want of earnestness about sanitary matters which may at any time prove disastrous to its reputation as a health resort.

Folkestone was originally a small town, noted for its smuggling and for its dirty streets, running up and down the very broken ground on which it was built; but since it has become a railway terminus and the port in correspondence with Boulogne, a new town has been formed. Magnificent rows of houses and terraces have sprung up on the Lees, the summit of a cliff about 100 feet high, and there is the great promenade, and the bands of the regiments from Shorncliffe play on particular evenings. One of the chief amusements here as at Dover is walking on the pier, and scrutinising the various arrivals and departures. Besides many smaller excellent inns, Folkestone has its 'Pavilion' which may be compared with the 'Lord Warden' of Dover. Only two miles off is the pleasant village of Sandgate, situated under the cliffs and beneath Shorncliffe. It is a favourite residence, has good sea-bathing, and is more sheltered than Folkestone. Its buildings are increasing, and it and Folkestone will probably soon meet each other.

Folkestone is particularly well worth seeing on days in autumn when there is a great take of mackerel.

The railway viaduct is a striking feature of the landscape. The parish church is a fine one, and it and the churchyard contain many curious monuments. Many pleasant excursions may be made, as to Sugar-Loaf Hill and Holywell. The lines of circumvallation of what is called Cæsar's Camp, which you observe from the railway on the left as you near Folkestone, are well worth examining. The camp at Shorncliffe and the crypt and its skulls of Hythe church, Saltwood and Lympne form objects for excursions, and the broken rocks of the Warren on the Dover side have been dignified with the name of little Switzerland.

The bracing air of its upper portions is the great characteristic of Folkestone.

There is a chalybeate spring a little way out of the town, of tonic virtues, but not said to be very pleasant to the taste. Apparently the establishment it was intended to form at it has not succeeded.

The bathing-ground is good; and since 1869 there has been one of the best bathing establishments in England here. It has billiard and refreshment rooms, and a lawn in front. There is a large swimming-bath, as well as separate baths.

The establishment at Folkestone gives us an opportunity of comparing the general arrangements of some foreign and of our English sea-side places; and we are glad to have been told by foreigners what they think on the subject. The following remarks are mainly those of a very impartial Frenchman, Dr. Labat, and comfirmed by our own observation. The French and the Belgians have embankments or jetties on some portion of their coasts. There is the embankment at Havre, and the great one at Ostend, and there are the jetties at Boulogne. But the English have them in far greater numbers, and on a far greater scale. Instances of this are the piers at Margate, and still more at Ramsgate, one of the latter nearly 3,000 feet in length; but it is in the jetties, built for the convenience of visitors, that they show the most magnificence. The jetty at Hastings, it is true, only runs out some hundred feet; but it is very wide, and supports a casino with a concert-room. The two jetties at Brighton are much longer, are highly ornamental, and supply every convenience for loungers, who can enjoy themselves out in the sea-air without dreading the sea or rain, or the motion of the waves.

Bathing-machines are another English invention; and though there is abundance of them at Boulogne, which is the most English of the French bathing-places, they are only gradually being introduced elsewhere. They have long been employed in the German sea-bathing islands.

But what English watering places are so superior to foreign ones in, is the incredible magnificence of their esplanades, their terraces and squares, macadamised roads and parterres of flowers close to the sea-side. The shore at Dieppe and the garden of the casino at Boulogne may give a feeble idea of this. But to understand it, you must see the vast, straight esplanades of Brighton or St. Leonards, which are nearly three miles long, with a road for carriages and side-paths for walkers, or the graceful curve of the esplanade at Weymouth or the terrace of Folkestone a mile long, and situated on a cliff 100 feet

high. In this respect nothing equals Scarborough, with its esplanade, its terraces, and the magnificent bridge which spans the enormous ravine which separates the two parts of the town.

The aspect of large English watering places is, on the whole, far more striking than that of any foreign ones, but the French casinos deserve favourable mention; they are generally superior, especially in cheerfulness, to similar places on the other side of the channel.

Whenever it is a question of amusements and of fêtes, the French have the advantage. The casinos of Boulogne, of Dieppe, of Deauville, leave nothing to be wished for, and dancing is more common in French than in English places. But to come to more grave matters, the arrangements for hot baths are generally better in France, and if you compare the new establishment at Folkestone with that at Boulogne, you see how far the former falls short of the latter in its dimensions, in its exterior and interior decorations, in its cabinets for hot baths, in its rooms for hydrotherapy, and, above all, in the size of its swimming-bath.

Except in the case of first-class hotels, which are pretty much the same on both sides of the channel, the English ones are, on the whole, cleaner and more comfortable. The English *cuisine* is more simple than the French, and is somewhat monotonous—but it is more nutritious, and probably contributes more to strengthen the debilitated patients who are sent to the sea-side.

To these views of a Frenchman we may add, that an intelligent German, Dr. Beneke, speaks highly of our sea-side places, and has not found them by any means so expensive as he expected. He does not consider them beyond the means of well-to-do Germans. Of course our bathing-places are far superior to the little islands, such as Norderney, with which the Germans must be content if they do not leave their country; but we have heard inland Germans talk with raptures of the sand dunes and the sea-shore, and the flow and ebb of the tide, which are all marvels to them, and which they can study in their own islands. Beneke, too, like all foreigners, is struck with the excellence of English meat, although its cooking may not be so much to his taste. And this reminds us that we have overlooked the advantages of sea-side places, in respect of the facilities they offer for varying the diet, and for eating more fish than is usually consumed at home. True, it is commonly said, that owing to the drain to London, fish is as dear at the sea-side as in inland towns—but this only applies to some of the kinds of fish that are most prized. On the whole, we doubt how far the profession generally appreciate the value of fish in dietetics.

We also find that we have omitted among the disagreeables of sea-bathing the possibility of coming in contact with jelly fish or with fragments of them, which occasion much prickling and an eruption on the skin, though painful, usually not of much importance. Nor are occasional bites of toes by crabs very serious occurrences. Cramp in the leg is an accident that occurs sometimes to swimmers, and it is dangerous when they are beyond their depth.

We have said nothing of dress in bathing. The more freely the salt water comes in direct contact with the skin, the more efficient is the bath, and it is undoubtedly best to bathe naked; but except in out-of-the-way places this is not practicable even for men: on the whole it is more convenient for them to use the short drawers known as *schwimhosen* in Germany. The looser the bathing-gowns of women are the better. But, in countries where the two sexes bathe together, as in most places in Belgium or France, closer fitting garments are necessary; and French women, as it is well known, indulge in every variety of picturesque costume, and few things are more amusing than to observe the various dresses in which they rig themselves out, and the different fashions after which they disport themselves in the water for the entertainment of the admiring bystanders. We have heard similar scenes described by travellers who had seen them in the United States, for the Americans closely imitate the French in their fashions.

We cannot bid good-bye to Dover and Folkestone without expressing our hearty compassion for those timid sailors who would cross the channel only in the smoothest days, and who go down to those places to watch the weather. They make themselves unhappy in anticipation by observing the throes and heavings of the ocean, and are often obliged at last to cross on a day when the sea is rough.

We fear that we cannot inspire such sailors with much confidence, even by giving them the benefit of the remedies prescribed by Sir Theodore Mayern, the great doctor of the day, when the Princess Royal was going to cross to Belgium in 1642.

Cinnamon, coriander, anise, ambergris, musk and sugar were to be made into long tubes, which she was to munch from time to time.

She was to drink a warm posset, should there be an access of vomiting. A plaster made of balsam of Peru, of gum mastich, and of laudanum, was to be applied to the pit of the stomach. She was also to smell the comforting vapours which arose from the following compound: well toasted bread, orange and citron peel, rose leaves, flowers of lavender, and cloves, to be hashed up together. On this Canary wine, elder flower vinegar, and cinnamon water were to be poured; portions to be successively applied to the nostrils. When she arrived on the other side, she was to have an aromatic plaster applied to the stomach, and, what was more to the purpose, she was to have her stomach strengthened with burnt claret having in it a sprig of rosemary, some cinnamon, and sugar, or with a caudle of ale or small beer made with Canary wine, eggs, sugar, and cinnamon! Such were the ways of comforting that distressed organ.

Parliamentary Proceedings.

HOUSE OF LORDS.

(*Saturday, August* 7.)

SANITARY LAW (DUBLIN) AMENDMENT BILL.

THIS bill was read a second time.

The Public Health (Scotland) Act (1867) Amendment Bill passed through committee.

(*Monday, August* 9.)

PUBLIC WORKS LOAN BILL.

THIS bill was read a second time.

SANITARY LAW (DUBLIN) AMENDMENT BILL.

THIS bill passed through committee.

Public Health (Scotland) Act, 1867, Amendment, Contagious Diseases (Animals) Act, 1869, Amendment Bill were read a third time and passed.

HOUSE OF COMMONS.

(*Saturday, August* 7.)

WANDSWORTH COMMON.

MR. SCLATER-BOOTH, in answer to Mr. Gorst, said the guardians of the Westminster Union, with the sanction of the Local Government Board, did propose to let for building purposes certain lands formerly part of Wandsworth Common. He did not know that there were any rights to interfere with this being done, but if there were those who had them would no doubt assert them, and the matter would be inquired into.

INFANT LIFE PROTECTION ACT.

MR. CROSS, replying to Mr. Charley, said he would take care that another return was sent out to ensure the completion of the returns relative to the Infant Life Protection Act, 1872.

Law Reports.

NUMEROUS BAD MEAT CASES.

AT Guildhall H. Sparrow was summoned for sending four quarters of a cow and the tongue to the New Meat Market, unfit for human food. Was let off as there was a conflict of evidence, but cautioned to be more careful in future, as he had suffered imprisonment for a similar offence. F. Jackson, butcher, Spalding, for sending three sheep to the New Meat Market which were unfit for food, has been fined 5*l.* for each sheep, and three guineas costs, or in default two months' imprisonment. W. Goodman, labourer, of Lidlington, Bedfordshire, for sending two quarters of a cow, the same being unfit for food, has been fined 5*l.*, with three guineas costs.

FISH REFUSE.

AT the Thames Police Court various persons have been summoned for having allowed a quantity of fish offal to be deposited at Sewell's Wharf, on the river Lea. Two of the defendants collected fish offal from markets and other places and took it to Sugar-loaf Lane, Stratford, where it was sometimes allowed to remain a week. It was then removed in uncovered carts to the river Lea and shipped on barges. The refuse was ultimately taken to Rainham or Barking, for manure. An inspector of nuisances said that at twenty minutes past four o'clock on the morning of the 6th inst. he was called by one of the neighbours to Sewell's wharf. He saw three carts leaving the wharf uncovered. He found a barge partly loaded with decomposed fish. It was moored at the entrance of the back river, six yards from human habitations. It remained uncovered until 3 o'clock in the afternoon, when it was disinfected by a doctor's order. The smell was very offensive. Dr. Talbot, one of the medical officers of health, said that on the morning of the 6th inst., his attention was called to the barge. The effluvium arising therefrom was in his opinion a nuisance, and injurious to health. Mr. Paget made an order for the abatement of the nuisance and for the payment of two guineas costs.

MILK ADULTERATION.

At Lambeth, Bridget Crean, of Alpha Street, Peckham, was summoned for selling adulterated milk. The milk was found, on examination, to be adulterated to the extent of 15 per cent. with water. The defendant said she sold it as she received it. Mr. Ellison fined her 10*s.*, and 12*s.* 6*d.* costs. Joseph Sims, Cornwall Road, Peckham, cowkeeper, was fined 50*s.* and costs, making 3*l.* 2*s.* 6*d.*, for selling milk adulterated to the extent of 33 per cent. with water. The magistrate remarked that it was a most shameful case. Jeremiah Austin, cowkeeper, George Street, Old Kent Road, was summoned for selling adulterated milk. Dr. Bernays stated that some milk bought at the defendant's place was adulterated with 15 per cent. of water. Mr. Ellison fined the defendant 40*s.*, and 12*s.* 6*d.* costs.

A. Harrod, was summoned for a like offence.—A sanitary inspector proved that the milk was adulterated to the extent of 15 per cent.—The solicitor for the defence, said that he had no good defence to make, except that the milk was purchased from Tring, and sold as received.—Mr. Newton said the offence was complete, but he should like to know who did adulterate the milk.—He had himself seen water put into milk whilst at a railway station.—Mr. Ricketts said he should prove that the milk was sold as received, and called Mr. Coles, who said he received the milk from Whittle farm in Hertfordshire, and delivered it himself as he received it. The daughter of defendant deposed to the same fact.—Mr. Newton fined the defendant 2*s.* 6*d.* and the costs, and said that the defendant could recover her expenses from Mr. Coles, and Mr. Coles in like manner could recover from the person who supplied him.

CEMENT WORKS.

VICE-CHANCELLOR BACON had before him on April 28 the important case of *Umfreville* v. *Johnson*. This was a nuisance suit in respect of cement works near Greenhithe. The plaintiff was the owner of Ingress Abbey, and the defendants, Messrs. Johnson and Co., purchased some land near Mr. Umfreville's property, with the object of erecting cement works thereon. The bill was filed in 1873, to restrain the building and carrying on the proposed works, so as to cause a nuisance to the plaintiff. At that time the erection of the works had commenced, but they were not in operation. Before the cause came to a hearing six kilns had been built, of which not more than two had been at work at any one time. The plaintiff alleged that it was intended to erect a large number of other kilns; but the defendants stated they had no such intention at present. The plaintiff adduced evidence that as at present used the works were productive of nuisance and annoyance. The defendants, on the other hand, contended that their works were carried on in such a way that, with the aid of two patent processes, all nuisance was obviated.—The Vice-Chancellor said he would first consider an objection raised by the defendants that at the time of filing the bill the nuisance was only feared, and not felt. The jurisdiction of the court was essentially preventive. If, for instance, a man saw a wall being built to obstruct his light, he would come to the court to stop the building. The plaintiff had proved that cement works were a nuisance; and the defendants, in fact, admitted that but for the process carried on under the second patent their works would be a nuisance, which patent they had not referred to in their answer. This was a case that had been established by the affidavits of ordinary persons by the evidence of their noses. A number of persons had given the evidence of their senses that they had perceived the smell of cement works—a smell they could not mistake for that of gas or another nuisance. If the defendants, as they alleged, could by means of their patents work their manufactory so as not to create a nuisance, they would not be injured by the injunction. On the other hand, it would not be right that they who had it under their control to use the works their own way, and were able to cause the nuisance, should be allowed to do so. He should therefore grant an injunction against the works being carried on so as to be a nuisance.

BRIEF NOTES OF CASES.

NUISANCE.

1875. *Umfreville and Murray* v. *Johnson*. Nuisance. Cement Works.—Bill filed by two plaintiffs in respect of properties at unequal distances from the works.—Injunction granted as to one plaintiff, but refused as to the other. Bill filed before the works were open, and therefore when the nuisance was only in anticipation. (W. N., 1875, p. 148.)

PROVISIONAL ORDER.

1875. *Morley, In re* 'Tramways Act, 1870.'—Provisional Order.—The Chancery, not the Parliamentary scale of costs, to prevail. (W. N., 1875, p. 75; 32 L. T., 524.)

WATER, POLLUTION OF.

1875. *A. G.* v. *Tunstall L.B.H.*—Pollution of River by Sewage.—Injunction granted. (W. N., 1875, p. 66.)

1875. *Harding* v. *Southborough, L.B.* Pollution of

Stream by Sewage.—Injunction granted against a Board, though all the members had resigned office. (W. N., 1875, p. 78: 32 L. T., 250).

WATER-SUPPLY TO COUNTRY VILLAGES.

SIR,—There are three villages in the Cardiff Union about being blessed with an ample supply of pure water by gravitation and services, by means of public taps fixed at convenient points near the houses, and also private service to any one who wishes to avail himself of it. The money to construct the works being advanced by the Public Works Loan Commissioners on the usual terms, repayable in thirty years.

The question is whether the sanitary authority can avail themselves of the '2*d.* a-week clause,' making the owners of all cottages using the water of the public taps contribute, 'not exceeding 2*d.* per week;' or is it necessary to carry the water into each house in order to enforce the powers just referred to. Your early reply will greatly oblige. JOHN E. THOMAS.

July 30, 1875.

[A tap cannot be treated as 'public' and 'private' at the same time. If it is 'public' no payment in respect of its use by particular houses can in our opinion be enforced. The water must be carried to each particular tenement in order to give the occupiers of that tenement exclusive rights as against strangers and passers-by.]

Correspondence.

MILK ADULTERATION.

(*To the Editor of the* SANITARY RECORD.)

SIR,—The following investigations into the adulteration of a sample of milk may prove of interest to some of your readers.

A medical man, practising in Warwickshire, on July 28 brought to my laboratory a bottle of milk, requesting me to make an analysis of its contents, but withholding till I had done so all information respecting it.

The bottle was an ordinary eight ounce medicine bottle, with an old label on it, written across, 'Milk. 5 P.M., July 27.'

The sample had no cream on it, nor was it at all curdy but had the appearance of genuine fresh milk, although when I saw it, it had been in the bottle for twenty-four hours.

The smell was peculiar, faintly putrescent. Blue litmus paper was slightly reddened. The specific gravity taken with an hydrometer, 1030; no cream rose on placing fifty cubic centimètres in a narrow glass vessel for twelve hours, but the milk when poured out of the vessel was a glutinous mass, with no separation of cream or curd. The analysis, conducted with exceptional care, each weighing being gone over three times, gave, in 100 cubic centimètres of sample,

Total solids	13·08
Butter fat	1·54
Ash	·54
Solids not fat	11·54

Microscopic examination showed numerous shrivelled round bodies with circular rings, and the usual oil globules in small quantity, many being very small.

The addition of iodine produced a thick yellow precipitate, which rose to the surface on boiling, the liquid becoming, when cold, greyish green to a dirty blue at the bottom of the test tube.

On dialysing this milk with distilled water outside the membrane for twelve hours the water contained lactose, chlorides, sulphates, nitrates, and nitrites.

I then made a similar analysis of the milk of an Alderney cow fed with sewage farm rye grass, that I knew to be a genuine specimen, with the following results.

Total solids	17·10
Butter fat	4·82
Casein	4.80
Lactose	6·48
Salts (ash)	·80
Solids not fat	12·08

Microscopic examination—oil globules large and numerous, no shrivelled ringed bodies present.

Iodine solution gave a yellow colour but no precipitate, nor was there any blue or greenish hue in the liquid. On dialysis found no sulphates, nitrates, or nitrites, although chloride of barium gave an opalescence, but not the distinctive precipitate of sulphate of baryta. According to Berzelius milk does not contain either sulphates, nitrates, or nitrites, nor did the distilled water or any reagents I employed.

The medicine bottle I found on inquiry had not contained, sulphates, nitrates, or nitrites, nor any medicine that would by chemical action give rise to them.

My opinion was, therefore, that the milk, from the low ash and butter-fat, had been adulterated with not less than 40 per cent. of water, and that this water was polluted with sewage. The large amount of solids not fat, which would by itself invalidate this conclusion, I believe to be owing to the addition of altered starch in the form of dextrine or British gum, which made an emulsion with the milk and prevented curd from separating or cream from rising, giving the sample the appearance of genuine milk.

I was then informed of the facts of the case.

This milk was sold by a small dairyman who kept two cows in a stable, fed with grass from the sewage farm. His well, though deep, could only be considered as a surface well; near the cow-house there was also a tank for soft water, both easily polluted by soakage from the cow-shed.

The well-water contained sulphates, nitrates, and nitrites; phosphates a considerable quantity, and total solids, 138 grains to the gallon (the average of the district being forty to fifty grains per gallon), as well as 0·212 free ammonia, and 0·54 albuminoid ammonia to the litre. The water smelt strongly of sewage when heated. I was not able to obtain a sample of the soft water for analysis.

The milk was ordered for a lady (who died of typhoid with severe diarrhœa) in the quantity of three pints daily, and was intended to be her principal source of nourishment.

Now this seems to me to be not only a cruel but a wicked case of adulteration, the patient, in a highly critical state, being deprived of half the nourishment her medical adviser thought she was taking, and being forced to swallow food polluted with sewage matters in a disease in which diarrhœa is a principal symptom, and from the increase of which she died, though it was not suggested that the habitual use of this milk was the original cause of the typhoid.

I much regret this case was not brought before the magistrates; but the delivery of the sample to the analyst could only be proved by the husband, who was reluctant to prosecute; and in his afflicted state the medical man did not wish to press him to appear in court.

HORACE SWETE, M.D.,
Medical Officer of Health,
Aug. 6, 1875. Droitwich District.
5, Newbold Terrace, Leamington.

HASTINGS AND ST. LEONARD'S SANITARY AID ASSOCIATION.

(*To the Editor of the* SANITARY RECORD.)

SIR,—I am very much obliged by your kindly notice of the Hastings and St. Leonard's Sanitary-Aid Association, contained in your article on the 'Health of Hastings,' reprinted in the *Hastings Observer* of last week.

You have very truly pointed out our chief difficulty,

which has been the maintenance from inadequate resources of our small sanatorium; but I am very thankful to be able to say that, though the municipality has not yet relieved us of this burthen, it is this year assisting us with a grant of 1*l.* per week, which will, I trust, suffice, with our voluntary subscriptions, to carry us prosperously to the end of the year, and in fact, until the much-to-be-desired cottage hospital shall be brought into existence.

We anxiously wish to see other towns adopting sanitary aid work in supplementation of the resources of their medical officers of health. I have many times said in various papers, how glad we should be to make known all the details of our proceedings to any inquirers. If it could but be recognised that the favourable state of things here in relation to epidemic disease is brought about (of God's permission) by intelligible and simple means, surely other towns would adopt our system, not necessarily by our kind of agency, but by some agency.

Yours sincerely obliged,

FRANCIS JOHNSTONE,

Manager to the Sanitary Aid Association for the Borough of Hastings.

Reviews.

CREMATION LITERATURE.

Cremation: the Treatment of the Body after Death. By SIR HENRY THOMPSON, F.R.C.S., etc. 2nd edition. London: H. S. King and Co.

THIS work of Sir Henry Thompson may be said to have awakened the people of England to a consideration of the advantages of cremation over other forms of disposal of the dead. It is more than a thesis, it is a practical treatise showing how the burning of the body can be performed without creating the slightest nuisance to the living. It has carried conviction to many thousands of our countrymen. Its appearance in English was shortly followed by translations in all the continental languages, while the number of comments, reviews, and leading articles which have been written upon it are legion. Indeed, it created such a sensation that a revival of all the old world systems of burial followed closely upon its production. Embalming, desiccation, sea-burial, burial in burnt clay and charcoal, and lastly burial in wicker coffins, are amongst the most prominent of the schemes which have been recently brought out as a set-off against this noble and thorough treatment of our dead. And it is not saying too much, that it will be read and studied when the late ephemeral and mere sentiment-defending productions are consigned to oblivion, or put upon the back shelves as specimens of the impossible.

Sir Henry's work, however, is so well known to the public that any description of its contents would be superfluous. We will, therefore, pass on to the later works which have followed in its wake, and which have been published in England. We cannot afford space to notice any of the Continental publications which lie before us; and, indeed, after winnowing out the merely descriptive and historical portions, all that is valuable in them will be found embodied in the English group which follows.

Cremation of the Dead: its History and Bearings upon Public Health. By WILLIAM EASSIE, C.E. Illustrated. London: Smith, Elder & Co.

FOREMOST among the batch of excellent literature which was the outcome of Sir Henry Thompson's celebrated essay on the treatment of the body after death, in the early part of last year, stands Mr. Eassie's work on cremation. Not only on the ground of *seniores priores* does this work deserve a place of honour, but on account of the thoroughness with which the author has reduced the theory of cremation to practice, and shown, not only why it should be done, but how to do it, in an effectual and inoffensive manner, without in any way wounding the feelings of the survivors. Probably the time has not yet arrived for this revived system for disposing of the body to come fully into practice; this, of course, remains to be proved. There can, however, be no doubt as to the sanitary benefits which the system of cremation would inaugurate. If, as we surmise, the time is not yet ripe, cremationists are only, as many other men have been and will be again, a little in advance of their age, and each one has done his best to educate the people up to their own standard.

Whatever may be the state of sentiment on this question, it is of paramount importance to the health of the living that the period of corruption which so rapidly follows death should be curtailed and, in fact, entirely done away with. As a matter of sentiment it is better that the last look at the departed should be associated with that indescribable beauty which always hovers for a short time over the newly dead, rather than that of the corruption which so soon follows, when

> Decay's effacing fingers
> Have swept the lines where beauty lingers.

The question becomes a vital one when contagious disease has been the cause of death. Then indeed fire is the only safeguard against epidemics of the most virulent kind spreading among the living. Fire alone will render harmless that most dire form of pestilence, the emanations of a diseased body, and quickly transform a mass of corruption into those life-supporting elements which in the great economy of nature it is destined sooner or later to become. It is surely better to think that the constituents of our dead friends' bodies have ascended to the clouds perchance to 'shine in the iris,' rather than to know or think of the corrupt and loathsome mass which they must become ere they are assimilated to their mother-earth. With the sea-change it is somewhat different,—we can imagine that

> Of his bones are coral made;
> Those are pearls that were his eyes:
> Nothing of him that doth fade
> But doth suffer a sea-change
> Into something rich and strange.'

It was probably this inspiration that prompted a clergyman, not long since, to advocate ocean interments. In a shallow sea abounding with edible fish, however, the idea of ocean interments is not a pleasant one, as we have not yet approached the ideas of Roman luxury when slaves were cast into ponds to improve the flavour of the fish. There is a theory that a well shotted corpse will sink down by the pressure of the water to the lowest ocean depth below the reach of animal life, and there remain perpendicularly *in statu quo*, preserved by sea water until the great end of all things.

This is but a theory, however, and probably if such a system of wholesale defilement were adopted, possibly the sea might cast up her dead before the time, and the remedy proposed would be worse than the evil which it is intended to cure.

In the work before us Mr. Eassie has condensed the result of his research and reading into a handy volume of 130 pages of printed matter. In the six chapters into which the work is divided he deals with the sanitary benefits and desirability of introducing cremation; the various methods of treating the dead in different ages and countries; the burial laws; new cemeteries—space which should be allowed, the nature of the soil to be selected, and depth of interment; and the regulations for closing old burial-grounds. Mr. Eassie states that he has been at the trouble to search the Patent Office records since 1781, and noted the various suggestions which have been brought forward with a view of improving the mortuary accompaniments. From 1781 to 1825 the principal object aimed at was security against rifling the grave (the body-snatchers seem to have been feared). From 1825 to 1871 the material for coffins appears to have exercised the ingenuity of inventors, as stone, marble, granite, slate,

porcelain, earthenware, bitumen, asphalte, paper, peat, India-rubber, iron, and glass have all in turn been dealt with. Glass has always since the days of antiquity been a favourite material, with this difference, however, that the ancients used the material for cinerary urns, whilst the modern idea has been to use it for coffin material. History repeats itself, however, and possibly the use of glass cinerary urns may be again revived. In view of this contingency Mr. Eassie has engraved a number of exquisite designs for urns, taken from the antique, but the *relievo* work modified to suit the symbolism of the Christian religion. The great danger arising from our present system of inhumation, and the consequent overcrowding of burial spots, are the disorders caused by putrid emanations, and the consequent poisoning not only of the atmosphere but of the wells and watercourses. On this point Mr. Eassie is very strong. A review of the system of cremation follows, and then comes the practical part of the question. This part comprises a careful description, with drawings, of Siemen's furnaces, as used in Germany and as suggested for use in England; and a thorough description of the *modus operandi* of the furnace in use is given.

The volume is a clear and lucid digest of the history, literature, and practice of cremation, and an irresistible argument in its favour. The value of the work is greatly enhanced by the excellent and carefully prepared drawings with which it is illustrated.

Ashes to Ashes: a Cremation Prelude. By the Rev. H. R. HAWEIS. London: Daldy, Isbister & Co., 1875.

MR. HAWEIS'S work is a defence of cremation in the form of a novel or tale, which we have perused with considerable pleasure. We have always believed that to be useful a treatise upon anything necessarily dry in itself can occasionally be written in attractive verbiage, and festooned with filagree. Even the technicalities of geology have been so treated by some of our very best professors of that science. Dry works upon somewhat abstruse subjects may do very well for the college; but in the house the book for the tired man of business is one that shall take his mind through the medium of his imagination. The Germans have a proverb that 'the beautiful is not always the useful;' but they do not reverse the old saw and say that the useful cannot be made beautiful. And as it has been said somewhere before, Horace, even in his day, versified to the effect that the writer who accomplished all that could be done with the pen, who carried every point, and who obtained universal commendation, was precisely the author who leavened the useful with the agreeable, and who diverted the reader whilst sensibly instructing him. It would be impossible, even were it not manifestly unfair, to give a sketch of the plot of the story, if plot it can justly be called; but we take the opportunity of saying that the whole novel is based upon a substratum of facts, and that the latter are duly noted in the appendix. The only crude idea in the whole book is that portion which recommends the establishment of a pyramid-shaped place for the reception of the urns. We wonder whether Mr. Thomas Wilson, the architect, who lately offered to submit some plans for a pyramid necropolis to the commissioners of sewers of London, in May last, got his idea from Mr. Haweis, or not. Mr. Wilson suggested a metropolitan place of sepulture which would accommodate 625,000 dead, and stand upon a superficial area of five acres only.

Cremation and Burial: An Examination of their Relative Advantages. By J. F. A. ADAMS, M.D.. Boston, U.S.: Wright & Potter, 1875.

A Contribution to the Subject of Cremation. 'St. Thomas's Hospital Reports.' By ALBERT J. BERNAYS, M.A., Ph.D. London: 1875.

The Disposal of the Dead. 'Indian Medical Gazette.' Wyman & Co., April 1, 1875.

IN July 1874 the State Board of Health of the Commonwealth of Massachusetts, U.S., became desirous of investigating in its sanitary bearings the subject of the disposal of dead human bodies, and in the hope of obtaining information pertinent to that inquiry certain questions were addressed to prominent men in America and Britain. The observations made by the various correspondents were communicated to Dr. Adams, and the paper before us is the result of a careful analysis of the various replies. The queries were as under:

1. Have you observed any instances in which sickness appeared to be induced or aggravated by the proximity of dwellings to cemeteries? If so, please cite cases.

2. In such cases, have you attributed the sickness to poisoned wells or foul air, or both?

3. Water believed to be contaminated with cemetery washings is desired for analysis. Send a gallon of such water, with a full account of such water, of its source, and of the illness it has been supposed to produce.

4. Do you consider interment the best method, in a sanitary point of view, of disposing of the dead?

5. If not, please state your views concerning cremation or any other method which you may think superior.

To this circular 171 answers were received from various States of America, and six from England and Ireland. The fewness of the replies from the Old World is greatly to be regretted, for justice can scarcely be done to the question of cremation in so new a country as America. The number of circulars sent out altogether were 480, and of these thirty were addressed to physicians in England, Scotland, and Ireland, who were supposed to take special interest in sanitary subjects.

To the first question eleven answered in the affirmative and 156 in the negative. To the second question eleven replies were received from persons who had observed sickness to result from that cause, three attributing it to foul air, four to poisoned wells, and four to both causes combined. To the third question, which is intimately connected with the two preceding ones, fifteen specimens of water were sent to the Institute of Technology, and there analysed, and the deduction drawn from this limited number of analyses was, that wells in or near cemeteries, unless very near to graves, enjoy an especial immunity from contamination, inasmuch as their position renders them less likely to be tainted by fæcal matter.

The last two questions had for their avowed object the obtaining of a general expression of opinion from the medical profession as to the adequacy of interments as at present conducted, and as to the need which may exist for the adoption of any other method. The number of correspondents who, in reply to question 4, answered in the affirmative were 109, seventy of which did not qualify their answers in any way, whilst eighteen specified precautions as absolutely necessary, and twenty-one approved of burials in the country only. At least this gives a fair dissection of the replies received in the affirmative. In the negative forty-four answered No.

To the fifth question the replies were groupable as under:

Approve of cremation	47
Approve in cities	14
Disapprove	21
Prefer embalming	3
Prefer chemical disintegration	4
Prefer encasing in Portland cement	1

Dr. Adams observes that although quite free from any personal bias in this inquiry, the value of the opinions against interment, and of those in favour of cremation, is, in his opinion impaired by the fact that they are based on theoretical grounds rather than personal knowledge. But he admits that, whether from hygienic or other reasons, more than a third give their testimony in favour of cremation as a substitute for burial. The investigation is summed up in a series of aphorisms, one of which states that the three methods of recent Italian experimenters are all unsatisfactory. Another approves of extra-mural interment, and several others refer generally to the subject of burials in Massachusetts. The last aphorism states that cremation

is not demanded in America upon any sanitary grounds; but 'if, however perfectly accomplished by the best method known, there is no reason why its adoption should not be optional with all persons.'

For the information of our readers we append in full those summings up which deal most with the cremation question:

'Pyre cremation, as performed by the ancients and by modern Asiatic nations, is an incomplete and disgusting process, certain to load the atmosphere with noxious fumes, and not certain to thoroughly consume the organic portions of the body.

'Cremation, accomplished by means of the Siemens furnace, at an enormously high temperature, the fumes being subjected to a second combustion, is a complete, rapid, and inexpensive process, in no way offensive to bystanders, nor liable to contaminate the general atmosphere. Sir Henry Thompson's first method, by means of a double reverberatory furnace, is apparently almost as satisfactory.

'Burial, in contracted spaces of ground, has been repeatedly proved injurious to the health of the community, in proportion as such spaces are overcrowded with bodies. This malign influence is most apparent during epidemics, when the mortality in the vicinity of these burial-grouuds has been frequently observed to be excessive.'

Dr. Adams's departmental work is prefaced by a most interesting account of cremation in ancient and modern times Intramural interments and the laws relating to burial at the present day are also adequately dealt with. We have read the whole with considerable pleasure, and congratulate the State of Massachusetts upon this public-spirited report.

Dr. Bernays proposes to burn the soil rather than burn the dead, and considers that a heavy clay soil would be admirably suited to compass a harmless decay, when once it has been rendered permanently porous by burning. In this condition he considers its power of absorption of gases is very great; and this power is nearly equalled by its property of slowly burning the gases. He would, therefore, swathe the body in a well-bleached fabric, and lay it in a coffin of perforated iron plate, covered with a lid of the same material; interring within forty-eight hours at the very outside. The coffin would be lowered into a grave the bottom of which would be covered with twelve inches of charcoal; and the grave itself, one foot wider than the coffin, would be filled in with burnt ballast to a depth of six feet from the surface, the superficies being afterwards planted. He recommends coffins of perforated plate because they would be strong enough to support the earth until oxidation had resolved the coffin as well as the body. Moreover, the ferric hydrate would, he believes, aid disinfection.

The article in the *Indian Medical Gazette* is of the usual editorial character, popularly written, and its tenor is altogether in favour of cremation. It admits that the Hindoo system must be credited with the most forcible sanitary arguments, adding that the destruction of the epidemic-poisoned body by fire is the safest method for survivors.

Essay on Fire-Burial, etc. By KARL BLIND. Longman and Co.

THE work of Karl Blind is one of the most instructive and, at the same time, one of the most beautiful contributions to the subject of cremation ever written, and, as may be expected, it is brimful of archæological lore. It deals almost entirely with the fire-burial customs of the ancient Teutonic nations, and is replete with classical quotations from Scandinavian and Old German sources. Indeed, it reads more like an Icelandic poem than an essay, and, as the quotations are given in the original tongue, the authenticity of the matter stands out in relief upon every page. From it we can learn how deep was the devotion to the practice of cremation in the hearts of the olden Celts, Danes, Germans, Swedes, Norwegians, and Sarmatians.

Herr Blind is an enthusiastic advocate of the proposed resuscitation of fire-burial; and it is not unlikely that amongst the German-speaking peoples this production from his pen will go very far to entice over to the new reform in burial customs the bulk of those who still cling to interment, and who are hinge-bound to the mistaken idea that cremation is an enemy to Christianity. We can conceive nothing more respectable than the hankering of a nation after a return to the customs of their forefathers, provided that those customs were originally wise ones. Germany is so certainly descended from races which patronised the torch and abhorred the spade that its reconversion to the early practice can only be a question of time. It was, indeed, but the other day that the Government of the Duchy of Gotha promulgated a decree legalising the cremation of the dead.

It would be quite impossible for us even to briefly epitomise the matter so liberally accorded from the vast stores of research at the command of the author, and we can only refer the reader to the work itself, which has lately been reprinted from *Fraser's Magazine*, in which it originally appeared, in a separate form.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

ALLEN, Alfred Henry, F.C.S., has been appointed Public Analyst for the Northern Division of the County of Derby, vice Scott, whose appointment has expired; 21*s.* per analysis, and 42*s.* per day when attending before magistrates to give evidence.

BARKUS, Benjamin, M.D. Univ. St. And., M.R.C.S. Eng., L.S.A. Lond., has been appointed Certifying Factory Surgeon for Gateshead, vice Rolfe, deceased.

BINNS, Charles, Esq., has been appointed Chairman of the Clay Cross Urban Sanitary Authority.

GARRAWAY, Edward, M.R.C.S. Eng., L.S.A. Lond., has been appointed Certifying Factory Surgeon for Faversham, vice Spyers, deceased.

GOODE, Henry, M.B. Cantab, M.R.C.S. Eng., L.S.A. Lond., has been appointed Public Analyst for the Southern Division of the County of Derby, vice Scott, whose appointment has expired; 21*s.* per analysis, and 42*s.* per day when attending before magistrates to give evidence.

GRACE, Henry, L.R.C.P. Lond., M.R.C.S., Eng., and L.M., L.S.A. Lond., has been re-appointed Medical Officer of Health for the St. George Urban Sanitary District, Gloucestershire, his appointment for two years having expired.

HEYGATE, William Harris, M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Crediton Rural Sanitary District, vice Body, deceased.

HEYWOOD, Mr. James, has been appointed Inspector of Nuisances for the Northern Division of the Bolton Urban Sanitary District.

LEWIS, Mr. William, has been appointed an Inspector under the Slaughterhouses, etc. (Metropolis) Act, 1874.

METCALFE, Captain T., has been appointed an Inspector under the Slaughterhouses, etc. (Metropolis) Act, 1874.

MORISON, Joshua William, L.R.C.P. Edin., M.R.C.S. Eng., L.S.A. Lond., has been appointed Certifying Factory Surgeon for th Pembroke District, vice Reid, resigned.

MYCROFT, Mr. W., has been appointed Clerk *pro tem.* to the Clay Cross Urban Sanitary Authority.

PAYNE, Mr. James, has been appointed an Inspector under the Slaughterhouses, etc. (Metropolis) Act, 1874.

PEACOCK, Mr. Joseph, has been appointed Inspector of Nuisances for the Bishop Auckland Urban Sanitary District, vice Wellburne, whose appointment has expired.

PRITCHARD, Mr. John Parrock, has been appointed Inspector of Nuisances for the Lichfield Urban Sanitary District, vice Davoll, resigned.

SMITH, Mr. T. Roger, has been appointed Surveyor for the District of St. Saviour, St. George the Martyr, and Christchurch, Southwark, and the Northern portion of Lambeth, vice Roper, resigned.

WETHERELL, Mr. William, has been appointed Inspector of Nuisances for the Selby Rural Sanitary District, vice Sutherland, appointed to the Mirfield Urban Sanitary District.

VACANCIES.

AXBRIDGE RURAL SANITARY DISTRICT. Four Medical Officers of Health: 50*l.* each for two years. Application, 16th instant, to William Trew, Clerk to the Authority.

BLACKBURN. Town Clerk: 1,000*l.* per annum, offices, stationery, etc., Surveyor; 450*l.* per annum, clerks, office accommodation, stationery, etc. Applications, 31st instant, to C. G. H. Beck, Town Clerk.

BRIDLINGTON URBAN SANITARY DISTRICT. Medical Officer of Health.

CARDIFF RURAL SANITARY DISTRICT. Inspector of Nuisances for the Southern Division: 150*l.* per ann. Application, 20th instant, to W. P. Stephenson, Clerk to the Authority.

CARNARVON RURAL SANITARY DISTRICT. Medical Officer of Health for the Llandwrog Sub-district: 15*l.* per ann. Application, 20th instant, to J. H. Thomas, Clerk to the Authority.

CHORLEY. Certifying Factory Surgeon.

CLAY CROSS URBAN SANITARY DISTRICT. Treasurer, Clerk, Medical Officer of Health, Surveyor, Inspector of Nuisances, Collector. Applications to Mr. Mycroft, Clerk *pro tem.*

CONWAY RURAL SANITARY DISTRICT. Inspector of Nuisances: 120*l.* per ann. Application, 20th instant, to T. E. Parry, Clerk to the Authority.

DERBY URBAN SANITARY DISTRICT. Surveyor, and Surveyor to the Corporation.

GODMANCHESTER URBAN SANITARY DISTRICT. Medical Officer of Health: 22*l.* per ann.

RHYMNEY URBAN SANITARY DISTRICT. Clerk.

ST. ALBANS, BOROUGH OF. Surveyor and Inspector of Nuisances: 100*l.* per ann., house, etc. Application, 17th instant, to Isaac N. Edwards, Town Clerk.

TREDEGAR URBAN SANITARY DISTRICT. Surveyor.

WHICKHAM URBAN SANITARY DISTRICT. Medical Officer of Health; 50*l.* per annum. Surveyor, 90*l.* per annum. Inspector of Nuisances, 40*l.* per annum. Application, 14th instant, to Thomas Lambert, Clerk to the Authority.

SANITARY PATENTS.

2545. An improved stench trap. Matthew Wilson, Loughborough Road, Brixton, Surrey.

2487. Improvements in ventilating and in apparatus therefor, part of which apparatus may be used for warming. John Rigby and Joseph Rigby, Manchester.

2521. Improvements in the purification and decolorisation of dye waters and waters which have been employed in washing lead minerals. Charlton James Wollaston, Westbourne Park Road, London.

2227. Deodorising Apparatus. Millington Henry Synge, United Service Club, Pall Mall, London.

2340. An improved, self-acting, universal ventilator, the improvements of which are also applicable for inducing a current for other purposes. Middlemost Wawn and Francis William Willcox, Sunderland, Durham.

2437. Improvements in hermetically sealing and preserving food and other perishable articles, and in the apparatus or receptacles used in containing or transporting the same. George de la Perrelle, Liverpool. A communication from Pierre Guerin, Haut Brion, Gironde, France.

2194. Moulding or constructing stench traps or syphon pipes. Henry Sutcliffe and Wright Sutcliffe, Halifax, Yorkshire.

1955. Purification of Gas. George Thomas Livesey, Old Kent Road, Surrey.

ABSTRACTS OF SPECIFICATIONS.

25. Drain-pipes. H. W. Stringfellow, Folkestone.

To reduce the cost of drain-pipes the inventor proposes to mould them in Portland cement with or without an admixture of sharp grit according to their sectional capacity, and the inventor thus obtains pipes impermeable to moisture.

107. Disinfecting fluid. B. F. Weatherdon, Chancery Lane, London. A communication from W. Vigné, ainé, Agen.

This invention consists of a disinfecting liquid formed of sulphate of zinc, acetate of copper, phenic acid, and crystals of baryta.

236. Heating and warming railway carriages. J. P. Scott, Manchester. A communication from J. Haag, Augsburg.

This invention consists in the application of wrought iron tubes welded at both ends, and with a flange in the middle in which the regulating valves are connected. Also in constructing the regulating steam valve so that it can be opened and shut inside the compartments of the carriages. Also introducing the steam into warming tubes placed under the seats in the carriages. Also in a self-acting valve which is placed between the two carriages. Also in making all the joints of the warming apparatus of solid metal.

135. Purification of coal-gas. H. Y. D. Scott, Ealing.

The objects of this invention are—first, the removal of the carbonic acid from the gas by means of magnesia; secondly, the breaking up of the bisulphate of carbon; and, thirdly, the abstraction of carbonate of ammonia from the gas liquor.

150. Purification of sewage. G. Rydill, Quality Court, Chancery Lane.

This invention of improvements is for the treatment of sewage and dye-waters as well as treating, purifying, and preventing the pollution of rivers and streams, so that the same may be used for domestic and manufacturing purposes by improved construction of vessels, tanks, reservoirs, areas; means and materials used to effect the same, and in improvements in machinery and apparatus for supplying water-closets with water, and in materials and method of purifying the same, which are also adapted for other purposes.

91. Purifying liquids. G. Mackay, Edinburgh.

The features of novelty which constitute this invention are purifying liquids by a solution of per-salts of iron, with or without the addition of sub-salts, and alkali or alkaline earth, utilising the impurities precipitated from the liquids as well as other waste or by-products, and obtaining a per-salt of iron.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer—not necessarily for publication.

UTILISATION OF WASTE.

PROFESSOR MOWBRAY, in a recent lecture before the Stevens Institute of Technology, on the subject of explosives, stated that nitro-glycerine is now largely made from the fatty waste of stearine and soap factories. Its density, which is 1·6, water being 1, enables it to exercise its tremendous force, for in a given bulk there is 60 per cent. more gaseous matter than would be contained in it were it only of the density of water.

COMPRESSED AIR AS A PRESERVING MEDIUM.

THE *Athenæum* states that, from some experiments which were recently described before the French Academy of Sciences by M. Bert, it appears that compressed air has a great effect in retarding putrefaction. In oxygen of high tension, organic matter may be preserved for a considerable time; and meat has been found fresh after keeping it for a month in oxygen at a pressure corresponding to forty-four atmospheres. This arrest of decomposition is due, according to the author, to the effect of the compressed oxygen in destroying any organisms that may be developed.

[According to M. Moigno, however, the process of M. Bert has been anticipated by Alvaro Reynoso.]

THE METHOD OF ESTIMATING POPULATION.

THE Registrar General, in estimating the population of a town or area for any year during a current decade, usually assumes that the geometrical rate of increase which prevailed during the decade between the two last census enumerations has been maintained since the last census. A description of the way in which this rate of increase is calculated and applied will be found in No. 24 of the SANITARY RECORD, published December 12 last. In exceptional cases this mode of estimate is of necessity departed from, and a rate is calculated from the increase of inhabited houses, when local information of this nature can be obtained. In cases of decreasing populations the Registrar General in most cases treats the population as stationary at the number enumerated at the most recent census.

THE SEWAGE DIFFICULTY IN AMERICA.

THE sewage difficulty in the large towns of the United States is apparently becoming urgent. The drainage of a large city like New York cannot be poured with impunity even into an estuary almost filled with sea water, and the ebb and flow of the tide spreads the solid refuse that pours out of the sewers over a radius of nearly twenty miles. Looking forward to the probable increase of the city and the certain increase of the nuisance from sewage, it is now proposed to intercept the whole contents of the drains and carry them out to the sandy grounds of Navesink, where they will be filtered and made to produce, possibly, a good proportion of the animal consumption of vegetables. A company undertakes to do all this gratis, provided only that the privilege to make use of the sewage shall be given to it in perpetuity.

THE MANUFACTURE OF CONDENSED MILK.

THE *Pall Mall Gazette* quotes some curious particulars of the condensed-milk industry in the United States, as given by Professor Arnold in the *New York Tribune*. Its extent is not exactly known, as the census reports of the country have omitted to enumerate the condensed-milk factories and their produce. Of these factories there are a dozen or more in the United States, the largest of which is probably that of Elgin, Illinois, which uses up 8,000 gallons of milk daily all the year round, and absorbs the yield of about 3,000 cows. The condensation of this quantity pays very well, but operations on a small scale do not answer, as the expense of running and the cost of machinery are much greater in proportion for small factories than for large ones. The cost of the establishment at Elgin, including the building and the apparatus for condensing and cooling, and the machinery for making the tin cans to hold the manufactured product, is estimated at 30,000 dollars. The milk for condensing must be of the best quality. Indeed, as the professor observes, 'The condition and quality of milk which are often accepted at butter and cheese factories and sold in cities and villages would not answer at all for condensing.'

Communications have been received from:

The Rev. J. Alton Hatchard, St. Leonards; Dr. Horace Smith, Leamington; Mr. Francis Johnston, Hastings; Dr. Grimshaw, Dublin; Dr. John Macpherson, London; Dr. T. O. Dudfield, London; Dr. A. Rabagliati, Bradford; Mr. G. W. Wigner, London; Mr. J. C. Mulliss, C.E., Coventry; Dr. John Simpson, Inverness; Mr. Francis George Heath, Totnes; Mr. John Robinson, Sedgefield; Dr. John M. Woodworth, Washington, U.S.; Lieut.-Col. Jones, Wrexham; Dr. John Duncan, Edinburgh; Mr. J. M. Scott, London; Mr. E. Spencer, Dublin; Dr. T. W. Grimshaw, Dublin.

NOTICE.

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Original Papers.

THE FUTURE OF EPPING FOREST.

BY FRANCIS GEORGE HEATH.

THE interest which is now felt by the public on the subject of Epping Forest must ere long be extended to all our royal forests. In fact the New Forest in Hampshire, and Dean Forest in Gloucestershire, have already, for reasons into which I shall not now particularly enter, attracted a share of public attention; and it is becoming increasingly manifest that nothing less than the most sleepless vigilance will avail to protect from invasion the rights of the people in the commons and woodlands that are still left to them. The exceptional interest which the inhabitants of the metropolis have taken in the struggle which has been maintained for so many years for the preservation of Epping Forest, has been excited mainly because the circumstances of Londoners have given rise to a keener appreciation of the value of free open space than could be experienced in any other city or town in the united kingdom; and the keenness of this exceptional interest will be understood to arise from a very natural cause. Nowhere is property, *i.e.* houses and land, so valuable as in the metropolis, and hence it is that the owners of such property guard their possessions with more than usual care. Enclosures of all kinds and rights of way are jealously protected. Every man regards his house as his castle in a peculiarly emphatic sense, and holds the smallest strip of land which may be his with a firm grip. 'No man's land' is not to be found in or near London. Hence the vast body of the landless, compared with whom the owners of land are a small body, having a right to walk only in the streets or in small squares, greens, or other commons, and in the public parks, naturally set a peculiar value on such an expanse of free woodland as Epping Forest.

In rural districts people are not driven to look so jealously after their rights, for, even where there are no commons, the owners of land do not, as a rule, enforce the law of trespass; and provided the public do not trespass in pursuit of game, they are content to allow them to have access to their property. The matter would wear a different aspect if every owner of land drew a line round his possessions, and at all times rigidly forbad access to the public. But even as it is the public have not too many commons, and against those which they have the hand of the encloser is perpetually directed.

My remarks are intended to show that the question relating to the preservation and appropriation of Epping Forest is one that should possess interest for all sections of the public, whether in town or country. What has been done in the case of Epping Forest will, to a large extent, serve as a precedent in other cases in which commoners' rights are affected. The health and recreation of the people are things not to be lightly esteemed, and it is imperative that adequate provision shall be made for them. Hence the special necessity of preserving the national forests and other large open spaces, not only when, as in the case of Epping Forest, proximity to great masses of the population shows the immediate need for their retention, but as a general means of providing for the healthful enjoyment of the public.

In two previous papers * I have discussed the merits of the Epping Forest question. In the last of these I referred to the schemes which were about to be presented to the Epping Forest Commissioners by, or on behalf of, bodies or persons who had been invited by the commissioners to make suggestions for the future management of the forest. These schemes had all to be presented by July 19, and they are consequently now before the commissioners. The most important of them are those presented by the committee of the Epping Forest Fund, and by the Corporation of London. The claim of the Metropolitan Board of Works to make suggestions for the future management of Epping Forest appears to rest on the circumstance that the Board has been specially entrusted by Parliament with the duty of providing and preserving open spaces for the recreation of the people of the metropolis. But a moment's consideration will show that, in reference to this particular point, the Corporation of London has a greater claim to be heard than the Metropolitan Board of Works. The celebrated chancery suit, undertaken by the Corporation in defence of the public rights in Epping Forest, involved the expenditure of a large sum of money; and the fund available for the purposes of this suit was that derivable from the city grain dues. The preamble of the Metage on Grain (Port of London) Act, 1872 states; 'Whereas it would be of great advantage to the inhabitants of London and the public generally that the open spaces in the neighbourhood of London not within the metropolis, as defined by "The Metropolis Management Act, 1855," should be preserved, and that the proceeds of the fixed duty should be applied by the Corporation for that purpose, and that they should be empowered to raise money for the same purpose.' The open spaces entrusted to the care of the Metropolitan Board of Works are those which are within the metropolis, as defined by the 'Metropolis Local Management Act, 1855,' and the money required for their preservation is obtainable from the general metropolitan rates. Epping Forest, therefore, is an open space with regard to which the Metropolitan Board of Works have clearly no *locus standi*.

The schemes of the Forest Fund Committee and of the Corporation—which have both been published—are very important and interesting. The scheme of the Forest Fund Committee is signed on behalf of the committee by Mr. Frederick Young, its chairman, and by Mr. William G. Smith, its honorary secretary. It recommends generally that 'All the wastes of the forest, including those unenclosed as well as those illegally enclosed, be preserved as one great undivided open space, maintaining as far as possible its natural and primitive condition, for the recreation and enjoyment of the people for ever,' and that 'the whole of the said forest be under one governing body, which should hold it as trustees in its entirety for the public.' The important and perhaps necessary suggestion is made that all lands now enclosed shall remain so. The public would not approve of any scheme which might contemplate the enclosure or sale of any of the open portions of Epping Forest, even for the purpose of raising a fund for the maintenance of the remainder. The Forest Fund Committee in their scheme make suggestions for the formation of a fund for the maintenance of the forest. The fund is to be raised

* See SANITARY RECORD of June 19 and July 17.

partly by the payments which will have to be made by persons who have erected buildings on forest land which had been illegally enclosed. So far as some of these buildings are concerned, it would be quite competent for the defenders of the public rights to obtain a decree for levelling them to the ground. But there is no desire to resort to this extreme course, although the owners of these buildings would deserve such treatment for having persisted in building, during the progress of the chancery suit promoted by the Corporation, on land which was the subject of the suit. Still, although the land illegally built on could be turned into common, it could not of course be restored to forest land, and as money is required for the maintenance of the forest it would be as well to make an arrangement with the owners of buildings erected on illegally enclosed land, by the terms of which they would be 'quieted' in the possession of the land on which they have built on condition of the payment either of a fixed rent-charge, or of a sum which would represent the commutation of such a rent charge. Should the fund raised by such payments be not sufficient for the purpose of maintaining the forest, the Forest Fund Committee suggest that the deficiency shall be made up out of the City corn metage dues. Apart from the cost of maintaining the forest, there will be an expenditure required for compensating persons who have long exercised various rights in the forest, such as digging gravel, or other portions of the soil, lopping trees, etc. The committee suggest that these rights shall be 'absolutely extinguished' after compensation. But they recommend that 'rights of grazing, vert, and venison' shall remain 'unaffected, and therefore uncompensated.'

One very good and important suggestion made by the Committee is that 'The Treasury or Parliament, as may be determined, shall refund to the owners of all the illegally enclosed land now to be thrown open, and to those persons who have purchased Crown rights over lands which are not enclosed, all monies paid by them for the purchase of Crown forestal rights over such lands, together with interest on the same. The Crown rights over Epping Forest ought never to have been sold; and as the Commissioners have decided that the purchase of Crown rights does not in any way affect the rights of the commoners, and that consequently all enclosures made on the strength of the acquisition of Crown rights alone are 'unlawful as against the commoners,' those who purchased Crown rights for the purposes alone of enclosure—and they were, doubtless, all purchased with this object—would be glad to have their money refunded, and would willingly relinquish any imaginary claim founded upon the purchase of these rights. This is, of course, a question for the consideration of the Crown, or of its representatives, or of Parliament. By the disposal of these rights the Crown has clearly been placed in a false position. In its possession they were valuable, and might have been turned to good account. They might, in fact, had they been exercised, have saved all the trouble and litigation which have been involved in the struggle for the preservation of Epping Forest. But their relinquishment by the Crown has benefited no one.

The Forest Fund Committee recommend the abolition of the existing Court of Verderers and the constitution of a 'new governing body of the forest,' to be called 'The Verderers of Epping Forest,' to consist of twelve persons, namely, the three present verderers or their successors, one person to be appointed by the Crown, five by the Corporation of London, one by the Metropolitan Board of Works, one by the borough of the Tower Hamlets, and one by the borough of Hackney. The surviving verderers are Colonel Palmer, Sir Antonio Brady and Sir Thomas White, and it is proposed that these should hold office for life, and that their successors who may be elected on their death or resignation shall hold office for seven years and then be eligible for re-election—the electors to be the parliamentary voters in the parishes within the boundaries of Epping Forest. The representatives from the two East End boroughs should, it is suggested, be elected by the parliamentary electors within those boroughs. It is suggested that in this 'governing body' the ownership of the soil of the forest shall be vested 'as trustees for the preservation and management of the waste lands of the forest as an open space for the recreation and enjoyment of the public for ever.' The powers to be given to the proposed governing body should be, it is suggested, full control over the forest so as to protect it from encroachment or injury of any kind by summary proceedings and heavy penalties against offenders. 'To enact by-laws for that purpose, and for insuring the maintenance of good order and decency by persons frequenting the forest. Such by-laws, when approved by the privy council, to have the force of law. To appoint as many forest keepers as may be necessary, and fix their stipends and duties. To drain, thin, prune, regulate, plant, make roads and paths, and otherwise do and enact all matters or things from time to time necessary for the management or improvement of the forest as a public recreation ground, and for the preservation of the deer and game thereon. To purchase, exchange, or accept gifts of lands to be added to the area of the forest and become part and parcel thereof; and such gifts, if made by will, to be valid, any Statute of Mortmain to the contrary notwithstanding.'

Such in substance is the scheme propounded by the Epping Forest Fund Committee, who, it will be observed, recognise the value of the great service rendered by the Corporation by recommending that five-twelfths of the representation on the proposed governing body of the forest shall be given to the Corporation.

The cardinal point in the scheme of the Corporation is that the Corporation shall have the entire control of the forest, subject only to the general control—which would, doubtless, be merely nominal—of a ranger, who, it is proposed, shall be a person of high rank or 'one nearly allied to the throne itself,' such person to be appointed by Her Majesty. Mr. T. J. Nelson, the City solicitor, states, in a memorandum which he has issued explanatory of the scheme of the Corporation, that it is 'based upon the firm principle that all illegal enclosures in the forest, excepting only those which are covered with houses or form part of pleasure grounds of moderate extent annexed to houses, shall be restored to the forest, and that the part thus restored, with the part still remaining open, shall for ever remain an open space, and be called "The Forest."'

Provision is made in the scheme for extinguishing all forest rights except the right of common of pasture; and a remarkable suggestion is made as to the exercise of this right. 'It is proposed that not only shall the right of common of pasture for cattle remain according to the ancient forest law, that swine shall

be allowed during the proper season to go into the woods to feed on the acorns and beech-nuts, but that the conservators of the forest shall also allow sheep to depasture upon the forest. To the extent, therefore, of the grass in the forest, it will not only be a place of recreation for the inhabitants of the metropolis, but will also assist materially in the supply of milk and food to London.' This is certainly an eminently utilitarian proposal, but I cannot say that I think it will commend itself to the public. Sheep are hardly in place in a forest, and too many cattle of any kind in such a place may become a nuisance; and it can scarcely be said that the inhabitants of the metropolis have ever had the least idea of looking to Epping Forest for supplies of food.

The proposal of the corporation in reference to the practice of 'lopping' trees in Epping Forest is an important one. This practice is supposed to have originated in a very curious manner. It is said that Queen Elizabeth, when residing on one occasion at her hunting lodge at Chingford, gave a charter to the poor inhabitants of the surrounding manors to 'lop' wood in the forest for their winter supply of fuel. The charter, it was said, stipulated that the lopping should commence at midnight, of November 11, in each year. The axes were first to be struck into the trees as the clock was striking the midnight hour, and if this was done every year with due punctuality, the privilege of wood-cutting might be regularly exercised until April 23 in the following year. But if the conditions were not scrupulously and exactly fulfilled the privilege would be forfeited. In some manors of Epping Forest the privilege has been forfeited through neglect of the commoners or through the devices of former lords of manors. It exists, however, in some of the manors, and notably in the Manor of Loughton, where it has been regularly exercised notwithstanding the enclosure of the waste of the forest in that manor. The enclosure of the Manor of Loughton has now been declared illegal. But before the chancery proceedings in reference to Epping Forest were commenced, and before the law decided that the Loughton enclosure was, with others, illegal, no attempt was made to dispute the annually exercised right of the 'loppers.'

'Lopping,' however, or 'top-lopping,' as it is called, has not been confined in its exercise to the commoners. The lords of manors, many of them, lop the forest trees in a wholesale manner; and certain persons also who are known as 'holders of assignments,' the assignments being of portions of the forest for purposes of lopping, and granted to them under an old forest custom, the custom having become legalised to a certain extent by being entered in the rolls of the old verderer's courts. The custom, however, has been greatly abused, not so much by the poor commoners, who chiefly lop for themselves, as by the 'holders of assignments,' and lords of manors, who lop and sell the wood lopped; and the sylvan beauty of the forest has, in consequence, been greatly marred. It is clear, therefore, that without doing any injustice to the holders of rights of lopping, a stop must be put to the practice; for in the plan for the future of Epping Forest æsthetic considerations must not be lost sight of. The corporation very properly urge that 'the lopping and topping of the trees of the forest at the pleasure of any of those who have hitherto had the right to do so would prevent the growth of anything like ornamental trees.' It is therefore proposed that the conservators of the forest shall 'in due course of husbandry, cut and trim the trees, and from that source satisfy all rights of fuel in the forest, or if the owners of those rights prefer it, buy them up and satisfy them by a sufficient supply of coal or coke.' The scheme further proposes that any other rights there may be existing in the forest yielding a profit and put an end to by the scheme shall be compensated.

The rights of the Crown the Corporation ask to have transferred to them as the proposed conservators, 'with a view to their being used in furtherance of the scheme,' and it is intimated that the Corporation would 'gladly come to terms with the lords of manors for the purchase of the soil of the forest when they take a just view of its value;' but it is added that 'it would be contrary to public sentiment as to the rights of property to force the owners to sell, and therefore the scheme is necessarily based upon the assumption that the ownership of the soil will remain in the lords of the manors.'

The corporation estimate that a large expenditure of money will be required 'to render the forest suitable to be one of the ornaments of the metropolis.' It is swampy in places, the trees are greatly neglected, and the abuse of the practice of lopping has transformed many of them into mere pollards. The corporation consider that these things should be seen to; but they promise that 'the natural features of the forest shall be "scrupulously preserved."' They propose, however, to construct 'ornamental waters' in the forest; and this proposal is scarcely consistent with the promise to scrupulously preserve its natural features. It is, further, proposed to drain the forest. A certain amount of draining may be required; but too much draining would, as has been very correctly pointed out, cause the disappearance of its mosses, which add so greatly to its natural beauty. The formation of roads and footpaths, if they are not made too neat and regular and prim, will, doubtless be useful, and tend to make the forest more accessible, if not more enjoyable. As a model of what art and nature combined can accomplish the *Bois* at Brussels may be cited. This was originally a forest somewhat similar to that of Epping, but it has lost none of its wild beauty from the advantage of arboriculture. This spot would well repay a visit to those who have the laying out of the ground. It is, further, proposed to re-stock the forest with deer; and, if it be found impracticable to keep them in the open forest, the corporation scheme takes power to erect one or more deer parks, 'from which neither the commoners nor the public are to be excluded, but only the deer fenced in.' For the effectual control and management of the forest, to protect it from injury, and the deer from molestation, as also to prevent nuisances and annoyances, and to protect the visitors and inhabitants, there will, of course, be required to be employed a large staff of officers. The corporation conclude, therefore, that 'the expenditure of capital in the first instance, and the cost of maintenance in the future,' will be necessarily heavy. To meet this heavy expenditure, the corporation propose, in the first instance, to resort to the plan which is suggested by the Forest Fund Committee—namely, to raise a fund by the aggregation of the rent charges, which may be imposed on those persons who have erected buildings on forest lands which have been illegally enclosed, or by commuting the rents for a pay-

ment down, in consideration of which the owners of such houses will be quieted in possession. A map has been deposited with the scheme of the corporation, and in it the land which has been illegally enclosed, but which is to be thrown back into the forest, is distinguished from land which will remain enclosed; and in the schedule attached to the plan of the forest, the rent-charge which it is proposed to fix on land not to be thrown back into the forest is named. Mr. Nelson's memorandum states that the task of preparing the map and schedule has been 'one of difficulty and delicacy;' but it has, he says, been discharged with impartiality. Mr. Nelson remarks: 'In arriving at a calculation of what each enclosure should pay, one universal rule has been followed—that of taking the value of the land as land, without reference to any buildings put upon it. In two classes of cases only has this rule been departed from; the one where churches, chapels, schools, or charitable institutions have been built upon land unlawfully enclosed, in which case the amount payable has been reduced by 50 per cent.; the other where persons have built houses, notwithstanding the bill in chancery filed by the corporation, which houses are not saved by the decree of the Master of the Rolls, and might be pulled down at any moment at the instigation of the commoners. In this case 50 per cent. has been added to the rent-charge.' It is anticipated by the corporation that the income thus to be derived from these rent-charges will yield a considerable amount towards the annual cost of the forest. But any deficiency which there may be, it is proposed to supply from the city grain dues. 'The metropolis will, therefore,' remarks Mr. Nelson, 'without being asked to defray the cost, or to part with a single acre of the available wastes, possess a real forest, accessible to all its inhabitants, and rivalling, both in extent and beauty, the Bois de Boulogne at Paris.' Mr. Nelson concludes his memorandum as follows: 'The scheme is believed to be a perfect execution of the duty of the commissioners as imposed upon them by the legislature. It asks that the money produced from the sale of the Crown rights should be handed over to the conservators as part of the funds of the forest, and that the cost of the Epping Forest Commission should be defrayed by Parliament.'

There can be no question that the proposals made in the schemes of the Forest Fund Committee and of the Corporation, for the future preservation and management of Epping Forest, are most important and interesting; and it is certain that they will materially help the Epping Forest Commissioners in arriving at a decision. As a matter of fact, the commissioners are empowered to frame a scheme themselves; but this is a duty which must be done in a manner which will accord with the public sense of what is demanded by the necessities of the case; and the commissioners will doubtless be glad of the help which has been, on their own request, tendered to them. The scheme propounded by the Corporation of London may be said to be in one sense a private one. It undoubtedly contains many excellent features; and it is clear that it has been produced as the result of very great care and consideration. The Corporation of London has rendered a great service to the public by its spirited defence of public rights in Epping Forest, and the public are not likely to forget that service. The help of the corporation was all the more valuable because it was tendered at a time when the proper representatives of the public, namely, the Legislature and the Government showed little inclination to defend the popular rights.

I am strongly of opinion, however, and I venture to think that on this point I carry the general sentiment with me—that the public ought not to be so willing to accept the services and the gifts of private bodies. Public rights ought not to need private defence. The public can afford to defray the costs of its own suits, and it should insist on having the advocacy of its own representatives. In a matter of such great and vital importance as that of providing means for the healthful enjoyment and recreation of the people, there should be no need to rely on accidental private effort in order to secure this object.

The questions of preserving necessary open spaces in the midst of densely populated cities, and of protecting public rights to common lands, where these rights are threatened or invaded, are questions which should and doubtless will ere long attract more attention than they have hitherto done, for they are questions of national importance.

The scheme prepared by the Forest Fund Committee for the future management of Epping Forest, may, I think, taken as a whole, be regarded as reflecting in an especial sense the popular wishes in respect to the preservation of the forest, and the proposal that the forest shall be placed under the control of an elective 'governing body,' is one likely to meet with general approval. In noticing this scheme and in concluding this paper it would not be right were I to omit especial reference to the indefatigable exertions of the Forest Fund Committee, a body which has been labouring for years to secure the preservation of Epping Forest. To that body, and more especially to three of its members, Sir Antonio Brady, Mr. Frederick Young, and Mr. William G. Smith, the public are largely indebted for labours unselfishly devoted to the one object of defending the popular rights.

CHOLERA EPIDEMICS.

BY A. RABAGLIATI, M.D., BRADFORD.

PART 3 of the seventh volume of the *German Quarterly Public Health Journal* opens with an appreciative article, by Birner, on the life of Esse and the interest which he manifested in the well-being of hospitals. His work in connection with the great hospital of La Charité, in Berlin, is carefully gone into. The article is worth perusal; but is of too personal a character for English readers.

We notice a series of reviews by Professor Geigel, of recent utterances on cholera, which are noteworthy as indicating the great diversity of opinion which even now obtains upon so important a disease. The first is that of Professor Hirsch, member of the Cholera Commission for the German Empire, 'On the Invasion and Progress of Cholera in the Prussian Provinces of Posen and Preussen from May to September, 1873.' Without going into the precise facts of the epidemic, which he says it would be useless to abridge, Professor Geigel quotes from the chapter on Prophylaxis the following passage.

'There is no doubt, as has been shown in the historical part of this report, that the cholera epidemic of this and last year in the Prussian Provinces, visited by me, can be referred, directly or indirectly, solely to the importation of disease from

Poland by raftsmen (*Hösser*). As far as the information extends, it may be certainly assumed that, if rafts infected by cholera had not come to Prussia, the districts of the Vistula would have been spared by the disease. Without assuming that cholera can be introduced by no other ways or through no other media, I am of opinion that the above-mentioned fact is of the greatest importance to the "sanitary police," and since the measures of the latter have not had the desired effect, it appears very necessary, having regard to all the given conditions, and founding on all our previous experiences, to discover and follow out new methods of prophylaxis.'

Hirsch's proposal in this case is, in order to make the rafts safe, to pay off the raftsmen at the Prussian frontier, and disinfect the rafts themselves, burning straw and such materials that may be on board of them. He shows that German men might be obtained to manage the craft, and that otherwise the proposal is quite a feasible one.

In conclusion, Hirsch points out the necessity of having some fixed principles based on scientific and technical experience, which should express the minimum condition for the organisation of a public hygiene. He shows the need of having sanitary officials thoroughly educated, and of their having such a position as should enable them not only to keep a watch on sanitary conditions, but also to exert a direct influence in that regard on the communal authorities. The second is by Dr. Schleisner, Delegate for Denmark to the Vienna International Conference, on the 'Course of Cholera in Denmark,' from its first European invasion, compared with the course taken by the disease in adjacent countries and neighbouring sea-port towns.

Geigel is of opinion (contrary to Schleisner's in this particular) that cholera in Denmark, though it exhibited much that is peculiar, owing to various circumstances, did not manifest any striking contrast to what occurred in other countries. Thus Geigel sees three phases through which the course of the disease usually goes, relatively to the means adopted to combat it, and thinks that Denmark manifests these.

The first phase is marked by the circumstance that in 1830, when Europe was first invaded by cholera, quarantine regulations were in their fullest vigour, and were made use of to combat the progress of the disease. The consequence was that in this time, so terrible to other countries, Denmark remained almost free from the disease.

The second phase is exhibited by the facts of the epidemic of 1853, when in Copenhagen alone, with its 130,000 inhabitants, 4,737 persons died; and in the whole kingdom 6,688 fatal cases occurred. In 1852 the laws of quarantine in Denmark had been abolished, and in consequence of the Danish medical men having embraced the 'miasmatic view' of the disease, no isolation of the patients was insisted on.

The third phase appeared in 1858, and exhibits the reaction from this, so to call it, involuntary experiment to determine the effects on a cholera epidemic by allowing it to spread freely in all directions. In 1857 there were among the Danish doctors several who held divided 'contagionist' views; and proper measures were therefore taken to isolate the patients, to disinfect, and particularly to discover the proper means between complete prohibition of intercourse and voluntary uncontrolled freedom of communication among the population. Other measures also were adopted, as the removal of ashpits and the introduction of a regular system for removing effete matter. Further, the water-supply was carefully attended to, and special lazarets were erected for the accommodation of the sick. It is to these measures, in the opinion of Geigel, that the fact is to be attributed that since 1857, notwithstanding repeated invasions and isolated outbreaks in other countries, Denmark has remained practically free from cholera.

Schleisner himself is driven to the conclusion that the measures taken in Denmark against cholera have had the greatest influence on the prolonged favourable results which have accrued, and he specifies those measures as the following:

1. No vessel, coming from an infected place, may run into the harbour or disembark passengers before having been examined.

2. In case of the vessel bringing cholera patients or corpses, it is kept isolated until the patients have been taken to an isolated hospital, and the ship and goods of the passengers, etc., have been cleaned and disinfected.

3. Each sea port must have an isolated hospital ready to receive imported patients.

Supplementary directions to be carried out in the country as soon as the local sanitary authorities have been informed of the outbreak of cholera in a port.

(*a*) A stringent supervision is to be kept over all lodging-houses, particularly over such as receive vagrants, travelling journeymen, and sailors. Their closets are to be daily disinfected.

(*b*) All station-masters, proprietors of hotels and inns, are requested to disinfect their closets.

(*c*) The first cases in a town are traced with the greatest care. The doctors are compelled to report at once to the authorities, besides sending in their weekly reports.

(*d*) The houses in which the first cases occur are carefully examined, and not only the patient, but also all persons who come into contact with him (and who, although not ill, may seem suspicious) are removed and kept in a proper place for a week, whilst all the other occupants of the house are examined for the same period. The author adds that it is of the last importance to use this last measure quickly and at the proper time, since the mildest forms of cases of infectious or epidemic disease are the most dangerous from a hygienic point of view.

Finally, he adds, that we must look upon cholera as a contagious disease, whose contagiousness is limited in the highest degree, and perhaps solely, to the fresh fæces and matter defiled by the same. There seems sufficient ground, Geigel thinks, for attaching considerable importance to an opinion formed from such a large experience. Still, he does not think that evidence has been adduced sufficient to overthrow all other views on the same subject, since the results on which Schleisner chiefly relies might have equally followed from other precautions; and, in conclusion, he defends himself from Schleisner's reproach that 'the result of accepting the purely miasmatic theory is, that we can do nothing but look on at the epidemic with a fatalistic equanimity; and that the consequence of accepting the spring-water theory is, on the one hand, that the spread of the disease by human intercourse has been concealed by it, and, on the other hand, that the measures which it necessitates are associated with an enormous expenditure.'

Lastly, Geigel reviews Gietl's 'Results of my Observations upon Cholera from the year 1831 to 1874, in their etiological and practical bearings.'

According to Gietl, who has had abundant opportunity of observing cholera, the disease is the complex of the symptoms of a process which takes place in the fluids of tissues (*Gewebewasser*). The cholera poison, among other hurtful properties, possesses in an eminent degree the power of producing that process in the fluids of the parenchyma, where their motion is impeded and their quantity reduced. This specific agent is certainly of dust-like organic nature, and is contained in the diarrhœtic fæces, but it has to undergo manifest metamorphoses until it attains the forms necessary for its spreading. In statistics regarding the occurrence of cholera in certain dwellings, the largest figures are given by small, dark, damp sleeping-rooms in the neighbourhood of open closets. The cholera poison thrives, on the whole, where it finds uncleanliness and putrefaction. Putrefaction and putrefying substances can of themselves cause the most perfect cholera in all its forms; but without the power of spreading or of multiplication. Temperature and season have a most marked influence on the spreading of the poison.

Dysentery and cholera are imported from hot countries, where they are formed by unknown causes, whose germ is multiplied in men and is spread everywhere by intercourse. The poison, therefore, never forms autochthonically, while it possesses degrees of intensity to which disposition and individuality occupy a subordinate position. It is a proved fact that diarrhœas are frequently spreaders of the poison.

It is a chimerical notion, according to the author, that the whole population of a place could partake of the poison, and that there is only wanting an external impulse to produce cholera.

The epidemic has, in its course, an increase and a decrease, but there is never any intermission. It has, like all lower organisms, a certain period of life, and its power of multiplying disappears gradually under the co-operation of external influences. A body impregnated with cholera poison seems to be incapable of a new reception of the poison. In the main the reviewer agrees with the author, as he does also with the views advanced in the conclusion and 'practical application' which he thinks bears the stamp of an experienced and thoughtful medical man.

Geigel also reviews a paper by Ranke, which details some experiments made by him on the possibility of conveying cholera infection to mice by feeding them on food infiltrated by the decomposing dejections of cholera patients. Hirsch's original experiments on this subject were repeated by Ranke, but the results were almost entirely negative, the mice thriving on their diet, but suffering when fed on filtering paper. The general conclusions are shortly summed up in the following statements of Ranke.

1. 'I cannot satisfy myself from observation that any specific material is formed by the decomposition of the contents of the intestinal canal of a person suffering from cholera, which is capable of exerting a bad influence on the health of white mice.'

2. Filtering paper, when eaten by white mice, appears to have a decidedly deleterious influence on their health.

There is finally an account by Delpech of the report made by the Council of Public Health to the Prefect of the Seine on the occasion of the outbreak of cholera in Paris in the autumn of 1873. The commission set itself to the examination of the following three points.

1. To enlighten the public as to the effect of the means adapted to the disinfection of such materials as may be calculated to spread the disease further, and how to have such means in readiness.

2. To state the means suitable for the cure of the primary, and therefore the less severe symptoms of cholera, and to secure the delivery of the medicines required.

3. To state what general measures are required to provide the sick with sufficient assistance in the event of the epidemic spreading further, and what are suited to the present condition.

In reference to the first point, the Commission proposes two sets of disinfectants (*a*) certain compounds of chlorine, and (*b*) compounds of phenol, or carbolic acid.

As to point 2, they recommend that the strictest watch should be kept over the initial diarrhœa, which should be treated by absolute rest in bed, the forbidding of solid food, the use of rice water, chamomile or peppermint tea, and a little rum, with enemata of poppy-heads and five or six drops of laudanum. In addition, free ventilation of the sick room, disinfection of the stools, and complete cleaning out of any room or house in which a death may have occurred.

Under the third head the Commission propose to distribute medicine widely to all persons unable to pay for them, and to make use of the hospitals and the various offices of the health bureau for these purposes.

The question is raised whether special hospitals are required, whether general hospitals may not be used for cholera patients, or whether the poor should be attended in their own poor homes?

The author thinks that in a limited epidemic it would be better to look after the sick in their own homes, but that other measures would be required if the disease were more extensive. He is of opinion that the sick should be isolated, and recommends that a special ward should be set apart in each hospital for this purpose.

Note.—These papers all declare more or less strongly in favour of the contagionist view of cholera, and ought to be compared with the views held by Pettenkofer after an elaborate and painstaking research into the course of the disease in Paris, Lyons, Malta, and Gibraltar. He comes to quite an opposite conclusion, believing that he has shown the dependence of cholera on the soil and spring water.

SANITATION OF HOUSES.*

BY WILLIAM EASSIE, C.E.

MR. EASSIE'S paper dealt specially with the sanitation of houses in reference to drainage. The evils of improper drainage are best observed in houses that have been from time to time added to until the cottage has become almost a mansion. One is then able to trace the first awakening up of the inmates, when the patrimonial cesspool has filled up and choked the drains. When this happened in villages, apparently all that had been done was merely to partially empty the receptacles and clean out the drains; and when this had occurred several times, and the sides had, so to speak, caved in, a new

* Read at the recent annual meeting of the British Medical Association at Edinburgh University.

dumb well was sunk, and the drains led into it—the old pit being covered up with a stone. It was cheaper to do this than to fill it up; and, besides, this procedure did not necessitate the absence of the family. It was the same in towns, and only a week ago I laid bare in a west-end London house three cesspools which had been dug in most brotherly proximity, and abandoned in rotation as they filled up with ordure and filth. Four cartloads of night-soil were removed, which could not have seen daylight for half-a-century. Nor would it now, had not the rats formed runs in their vicinity, and allowed horrible smells to invade the house by way of a long-forgotten back drain.

The reason why these ancient nuisances are found inside houses in towns and cities was not because they could not be accommodated outside the house, but because the slops from the kitchen and bath and laundry wastes were insufficient to flush the more solid wastes outside the walls. In nearly every case, too, the drains were of brick, laid with uneven bed, through the joints of which the fluids percolated. Let us take an instance. A cottage is drained into a cesspool in the kitchen, and when that is full another is dug, until the place is honeycombed with them, the subsoil saturated, and the well poisoned. A common privy is used in the yard, and this performs the same evil functions. By-and-by when water-closets are introduced and earthenware pipes, the cesspool for these is now dug down in the garden, with a lower one for an overflow, and both cemented down air-tight fashion. There is no ventilation of the drains whatever, except through the trapping water of the syphons at the foot of sink waste, soil-pipe, or rain-water stack.

Drainage into a cesspool is not necessarily dangerous, provided only that the waste pipes of the sinks deliver outside over a trap; provided, too, that the soil pipes are carried roof high, and a foul-air withdrawing-cowl fixed upon them. It might, in some cases, be absolutely necessary also to ventilate the cesspool by an upright shaft, or a ventilating charcoal trap in the stone cover, and it might even be wise occasionally to ventilate the march of the drain. Where a common privy is used, an earth or ash closet ought to replace it.

The next difficulty with the house in question very likely arose when a parish sewer was put in the main road, and the value of the land enhanced so much as to make it worth while to add an extra wing or two, to convert the old stables into servants' offices, and to erect new stable accommodation. When this happened, sometimes the one half of the house was drained into the sewer and the other half into the old cesspools. The old cesspools were not, however, dug up in the basement of the house, neither the urine catch-pit in the stables.

The end of all this is not difficult to imagine. Even should the whole of the cottage chrysalis, but now winged mansion be drained into the new sewer, it is just possible that the drains are laid without fall, or with backward fall; syphons put in where they ought not to have been; rectangular bends instead of acute ones; and a ventilating shaft not only forgotten, but the sinks, baths, and lavatories taken direct into the drains. The result, if not disastrous in the matter of health to the inmates, has proved in hundreds of cases sufficiently annoying to compel the dismissal of the builder and the attendance of the engineer.

It is very easy to so arrange the plan of a house that the whole of the wastes shall deliver immediately outside the house, and to have nothing but the outside wall between the water-closets, lavatories, and sinks. When it is found advisable to drain the basement, this can be disconnected from the main drain, so to speak, by interposing over the junction a ventilating shaft. The sinks and lavatories should all deliver over an open chamber. For the rest the walls of the house should be built hollow, and protected from rising damp also by a proper damp-proof course.

The paper was well illustrated by means of diagrams, and in the discussion which followed several prominent medical officers of health testified as to the soundness of the author's views.

THE
SANITARY RECORD.
SATURDAY, AUGUST 21, 1875.

THE PAST SESSION.

THE past session, if, perhaps, it has not realised in all respects the high hopes raised among the ardent sanitarians at the commencement of the parliamentary year by the *Sanitas Sanitatum* policy to which the Government had pledged themselves, has no by means been an unproductive one. A vast amount of honest and good sanitary work has nevertheless been accomplished.

If the ideal measures which were contemplated have not in all cases been realised, the ground has been prepared for future sanitary legislation, which will advance the good work that has been commenced.

The Artisans' Dwellings Bill, which received the Royal assent June 29, is generally approved of, although some exception has been taken to the clause which limits its provisions to towns of 25,000 inhabitants. Under the bill, which was passed with little alteration, corporations may, on the report of their medical officers, acquire buildings by compulsory purchase for the purpose of improvement. They may either build or let the land for building in accordance with schemes which they are to prepare with special regard to the accommodation of the working classes. The measure may be regarded as a tentative one; and if its operation be found beneficial, its provisions may be easily extended to smaller towns. Mr. Cross was well advised in trying the experiment among large populations, which are most liable to the evils of crowding. If the corporations of large towns prove to be indifferent to the facilities afforded by the Act, it will be useless to appeal to smaller bodies.

The bill which is now being enforced in the metropolis and elsewhere will have the effect of adding materially to the duties and responsibilities of medical officers of health.

A measure having similar objects in view for Scotland became law on August 2. Mr. Bruen's bill for improvement of the agricultural labourers' dwellings in Ireland dropped on the second reading. Lord Shaftesbury's bill to amend the condition of chimney-sweeping boys passed the Commons on August 3.

Mr. Sclater-Booth's measure for the consolidation of the Sanitary Acts has many shortcomings, and after much consideration and discussion has been generally received, not as a perfect measure but as one which evolved to a great extent order out of chaos, as represented by the numerous Public Health Acts passed during the last five-and-twenty years. These presented a more labyrinthine obscurity than any other branch of legislation. It was difficult for practised lawyers, and impossible for local officers, to find their way among enactments referring to former enactments, which, again, repealed or re-enacted parts or the whole of clauses in a dozen succeeding Acts. The new Health Act, though unavoidably voluminous, is a code in itself, which may with comparative facility be hereafter corrected and supplied. The president of the Local Government Board and his assistants deserve credit for an unambitious, laborious, and useful enterprise.

One other of the *magna opera* of the session was the Sale of Food and Drugs Bill brought in by Mr. Sclater-Booth and Mr. Clare Read in May. This measure was introduced to repeal the Adulteration of Food Acts, and to make better provision for the sale of food and drugs in a pure state. The bill gave rise to an interminable amount of discussion, as it involved the much more abstruse question as to what constituted adulteration, which not long before so severely exercised the minds of the public analysts. The bill, after many adjournments and amendments, in the Lower House and the Lords, passed its various stages in July.

None of these measures can be looked upon as perfect in their present state. It is satisfactory to know that in all, but in the latter especially, the Government, have listened to carefully, and in a great measure acted on, the advice of those who are most competent to give it, viz., the Society of Public Analysts, the British Medical Association, the Association of Medical Officers of Health, and other kindred associations, and also from gentlemen who have shown themselves not only able, but willing, to point out the evils which existed and the requisite remedy.

It must be borne in mind that these measures have had to do with evils of a long growth, and to lop off excrescences which necessarily leave a soreness in many places; but they are also of a nature which leaves us good ground for hope in the future.

It is a matter of regret that one imperial measure relating to public health which would embrace the whole of the United Kingdom cannot be passed; but the laws and customs of Ireland and Scotland are at present so distinct from those of England that a separate system of legislation is necessary. Amongst the minor measures which became law were the Artisans' Dwellings, Scotland, introduced by Mr. Cross, and passed August 2; Mr. Chorley's Infanticide Bill; the Metropolitan Local Management Act, June 28; the Pharmacy Bill; the Public Health, Scotland; and a few smaller measures.

Lord Salisbury's excellent bill for the purification of rivers dropped through, as also a small Act of Mr. Whalley's for Utilisation of the Waste Spaces in the Metropolis. A number of other bills were also consigned to the limbo of good intentions. On the whole, however, we can fairly congratulate ourselves on the sanitary work of the past session, and the notices of a sanitary nature on the paper for the next session lead us to hope confidently that the ball which has been set rolling will not be allowed to stop.

WATER-SUPPLY.

IT would be impossible to overrate the importance of the communication which is published by Dr. Alfred Carpenter, in the *Times* of August 13, on the dangers of intermittent water-supply. This subject has been brought to the notice of the public on various occasions by that gentleman and others within the last ten years; the object having been to draw the attention of local authorities to the dangers they incur by continuing to use an intermittent supply through services designed for use under a system of constant pressure only. He has supported his views by a reference to cases in which it appeared that illness had been introduced into families through the water-supply. Although that supply, as far as the public was concerned, was generally pure. In consequence of alterations in the mains, or for the purpose of making new connections, the water-supply to a given district was per force made intermittent for a few hours only. The services became empty in their higher parts, and an air-pump action ensued which caused the exhausting services to be charged with air or water from impure sources through defective fittings or oxidised pipes. Illness of a specific character followed, and Dr. Carpenter connecting them as cause and effect, did good service in drawing the attention of local authorities to the circumstances, so that the evil might be reduced to a minimum. The truth of the deduction was made manifest by Dr. Buchannan at Caius College, Cambridge, three years ago, and still more recently by Dr. Thorne Thorne at Lewes. We should have supposed that further proof was no longer required on this subject. It appears, however, that the Croydon local board of health did not think so when they proposed in the month of February last to make their usual constant water-supply an intermittent one. Dr. Carpenter warned them as to the inevitable result; his warning was disregarded, although published in the proceedings of the local

board. The result is before us in the report of the medical officer of health as well as in Dr. Carpenter's letter; within a week of the establishment of the intermittent supply typhoid fever developed itself, and within a month more than 250 cases existed in the water district. The intermittent supply lasted for five days only, but the result, as Dr. Carpenter states it, was 'a list of thirty-four killed and upwards of 400 wounded' within the space of twelve weeks from the establishment of the epidemic. The writer suggests that a power should be given by law to the injured and the representatives of the poisoned parishioners to recover damages from the local authority for thus defying the teachings of experience and science.

It only requires a few more such cases to render the establishment of such a law a certainty. It is only by the prospect of a money payment in the way of 'liquidated damages' that we shall ever hope to get the 'local authority' to see that prevention is better than cure. We should, however, have hoped better things from the Croydon local board of health, considering the advantages they have had; but it often happens that those living under great advantages profit the least by them.

There is, it is true, a 'per contra.' According to Dr. Carpenter's letter they contend that they have not the power by law to compel the change of the defective fittings which now allow of contamination. They say the fittings were first put up at their own recommendation, and that to order the inhabitants to change them now would be unjust and oppressive.

This is peculiar reasoning with a vengeance; because certain things were done some time ago in ignorance of possible results, therefore they must remain to occasionally act as inlets for the poison of enthetic diseases, whenever the exigencies of the water services require alterations or additions, to say the least of it is most narrow-minded. The local board of Croydon are bound to order the immediate alteration of the dangerous fittings now in use. If the law will not give them power to do so under present acts we are much mistaken; until they have tried their power they are not in a position to say it is not sufficient for the purpose. It appears to us that the excuse, like that urged against the Tottenham authority, is only to cover some other reason, and we consider that as the case stands at present, on *primâ facie* evidence, it would be most likely that if the thing recurred again a verdict of manslaughter against the local authority's representative would be certainly returned if the matter could be tried before a jury of our countrymen.

We shall watch the *dénouement* of this important matter with some interest, because it appears that local boards may do much evil as well as much good, may introduce disease into households as well as prevent its introduction; and it does not appear to us that it is possible for matters to continue as they are.

Notes of the Week.

THE outbreak of small-pox had almost disappeared from Athenry, but we have just been informed that two new cases have occurred. The relief fund which had been organised is no longer required, as the sum which has been subscribed is sufficient to give assistance to all the sufferers from the last epidemic.

A NEW SYSTEM OF SEWERAGE FOR WHITBY.

THE local board at Whitby appear to consider that the sanitary condition of this seaside town and watering place is susceptible of improvement. No other conclusion could well be arrived at after a careful consideration of the mortality statistics of the town during recent years. At a recent meeting of the local board a resolution was passed to engage the services of Mr. Manser, C.E., of London, to superintend the new sewerage scheme, which it is intended to carry out. The Local Government Board have recently authorised a loan of 3,000*l.* to be expended in the rebuilding of Spital Bridge, on the understanding that the principal and interest are to be repaid in thirty years.

WATERING PLACES ON THE CLYDE.

DR. WILLIAM WALLACE, of Glasgow, has directed public attention to the unsatisfactory state of the shores of the various watering-places on the banks of the Clyde. The stink from sewage and decaying matter at low water is said to be worse than ever this year. Dr. Wallace points out that this state of things is intimately associated with enteric and other forms of fever, that the time is fast approaching when these watering places will be no longer habitable to health or pleasure seekers, and that already many parents consider it safer to go to some inland place, or even to remain at home, rather than run the risk of having their children struck down by sewage diseases.

EAST GRINSTEAD.

THE rural sanitary authority for East Grinstead some short time back advertised for schemes to be submitted to them by Engineers, for the sewerage of the town and for the disposal of the sewage, on the understanding that the author of the scheme chosen should be employed to carry out the works.

Schemes from sixteen engineers were sent in for the consideration of the sanitary committee, who have decided to recommend the board to adopt one submitted by Messrs. Smith and Austin of Hertford.

The accepted scheme proposes to sewer the town with small earthenware pipes upon the separate system, and to dispose of the sewage by irrigation upon land rather more than a mile from the town.

THE MEDICAL PROBLEMS OF THE DAY.

IN answer to 'An Anxious Inquirer,' the writer of the article with the above title which appeared in our columns begs to say that, compared with the long history of mankind, the Early Anglo-Saxon settlers of the Eastern States are but so short a distance removed from the present generation that the term 'little more than grand-daughters' is not at all improper. As to families of twenty the reference cannot at present be laid hold of; but to show the fecundity of the early emigrants to America, the following quotation from 'Evangeline' may be adduced.

'Father of twenty children was he, and more than a hundred
Children's children rode on his knee and heard his great watch tick.'

The Acadians were French on British territory truly, but this is sufficient to illustrate the truth of what is said in the article. As to the substitution of the word 'barrenness' is the precursor of extinction for 'rarity,' its use was quite permissible under the circumstances, and the objection is frivolous.

FLIES AS CONVEYERS OF CONTAGION.

AMIDST the different methods of conveying contagion the feet of flies and their probosces must not be underestimated, especially at this season when flies are beginning to be numerous. The sublime indifference to consequences exhibited by flies in passing from the surface of the most odious substances to that of material for human consumption is complete. But if the flies themselves are uninjured by contact with putrefying matter, the next article of food they rest upon may be influenced by the previous contact, and may be thus either induced to undergo putrefactive changes more readily, or may even become a carrier of material of an eminently septic character. Not only that, but flies pass quickly from surfaces on one organism to another, and it is highly probable that the communication of septic poisons by their agency is not by any means rare. That flies are scavengers most persons who have studied the matter will admit; but even if thus useful they may, nevertheless, in virtue of that very function, be sources of danger.

A CORNISH BURYING GROUND.

THE description of the churchyard of Talland, which is the burial place of West Looe, in Cornwall, reveals an almost incredible amount of ignorant apathy and culpable negligence on the part of the local authorities. It appears that over 8,000 bodies have been interred in a space of ground a little over half an acre in extent on a very shallow soil, and to such an extent had the interments been continued that no space was left between the graves, and the graveyard had been raised so high in consequence that the church itself appeared to have been built in a pit. The pollution of the atmosphere from sulphuretted hydrogen was such as to turn violets black in a few hours, and to render it necessary at times to adjourn the service from the church to the rector's house. The whole description of the place, as given in the local papers, is so revolting that we refrain from quoting further. Mr. Holland, the Government Inspector, has been down to the place in question, but states that he was holding over his report until he saw what steps the ratepayers were about to take. From the report before us we find that after a stormy meeting had taken place the final resolution was to the effect that they would do nothing. Under these circumstances it is incumbent on the Home Secretary to deal with the matter in an effective manner.

THE SANITARY CONDITION OF COWES.

THE Chairman of the Cowes local board recently turned the first sod preparatory to the necessary excavations for the construction of two new reservoirs in order to secure an adequate water-supply for the district. These reservoirs are intended to hold seven and a quarter millions of gallons, and their cost will be about 7,000*l*. Cowes at least is to be congratulated upon being untrammelled by a water company, and upon having the supply in their own hands. After the inauguration ceremony there was a luncheon, at which the chairman of the local board presided, who in proposing 'Success to the New Reservoirs,' expressed his belief that this event was only the commencement of a new era for the town, and that after the water-supply had been settled, they would have their drainage system to go into. As we recently had reason to point out, the mortality statistics of Cowes are suggestive that the sanitary condition of the town is susceptible of improvement, and this promised activity in health matters augurs well for the future. One other point connected with the health of Cowes we should have liked to see mentioned in the after-luncheon speech of the chairman of the local board. Cowes has, or till quite recently had, no medical officer of health. If the local board have declared war against the sanitary shortcomings of the neighbourhood, the sooner they appoint a skilled medical officer, on whose advice they can rely, the more likely they are to be successful in the contest.

INTERMITTENT WATER-SUPPLY AND TYPHOID FEVER AT CROYDON.

THE last weekly return of the Registrar General shows that the recent epidemic of typhoid fever in Croydon has not yet disappeared, as three fatal cases were registered in the week ending 14th instant. The medical officer of health, Dr. Philpot, and Dr. Alfred Carpenter have each published their deliberate opinion that the outbreak is due to the intermittent water-supply, and the direct communication between the mains and closets and urinals. Dr. Philpot stated that 'the epidemic (as such) was confined to the area supplied with water by the Croydon Water Works,' and in evidence that it was due to defective water and not sewage, added, 'the outbreak ceased where the sewer area extended beyond the water area.' The whole case was ably and conclusively re-stated by Dr. Carpenter in a recent letter to the *Times*. The only argument adduced in favour of the present system, which supplies typhoid germs with the water, is a paltry one of difficulty in the way of the new water-fittings which would be necessitated by a constant supply. Surely the local board of a prosperous community like Croydon ought to have the power and ability to face a difficulty which appears to hinge upon water-fittings.

POLLUTION OF THE RIVER LEA.

AN official inquiry has recently been held at the Tottenham Local Board Offices by Colonel H. Ponsonby Cox into the condition of the Lea, which Dr. Tripe in his report on the sanitary condition of Hackney pronounces to be in 'a very bad state.' The origin of the inquiry was a complaint made by the Lea Conservancy Board to the Secretary of State, to the effect that the Tottenham Local Board were not, in accordance with the 51st section of the Lea Conservancy Act, using the necessary precautions to secure the requisite purity of the effluent water from their sewage works. The Tottenham Board produced evidence as to two samples of the water in which fish had lived three days without injury, and not only urged that the quality of the effluent was superior to the standard laid down by the Rivers' Pollution Commissioners, but that it was also superior to that of the river into which it was discharged. It was stated, in evidence, that there were more than twenty-four places which have sewage outlets into the Lea above Tottenham, fifteen of which use no purifying process. The managing director of the manure company which is now in possession of the sewage works of the Tottenham Board, described the precipitating process adopted for dealing with the sewage as one of the best known. The case on the part of the Lea Conservancy Board was not completely made out, as they failed to produce any samples of the effluent water they complained of, which the Government inspector very naturally considered necessary. Samples were ordered to be taken from time to time, so that the official report and decision in the matter is of necessity postponed.

SEWAGE DEPOSIT AT CROSSNESS.

ABOUT a year since the Thames Conservancy Board addressed a communication to the Metropolitan Board of Works, alleging that between 1870 and 1874 a deposit of from seven to eight inches had accumulated on about three quarters of a mile of the river bank, just opposite Crossness; and that this deposit amounted to 240,000 cubic yards of mud, the result of the sewage outfall. Sir J. Bazalgette, the engineer to the board, has recently issued a report in answer to this allegation, in which, while admitting the statement that this accumulation had taken place between 1870 and 1874, he points out that this kind of deposit is of a very fluctuating character, and that between 1872 and 1874 the amount of deposit on this bank actually declined to the extent of 313,000 cubic yards; in other words that the bed of the river was actually deepened in that period by ten inches. Although the Crossness outfall was opened in 1866, the Conservancy Board did not allege

any accumulation of deposit between 1866 and 1870; in point of fact it is stated that the deposit actually decreased by 554,000 cubic yards between 1867 and 1870. The report in question asserts that by a careful comparison of the Metropolitan Board's soundings, which have been systematically taken since 1867, between that date and the present time there has been an increased scour and an actual improvement in the depth of this part of the river to the extent of ten inches. At the same time Sir J. Bazalgette acknowledges his belief that the mud deposits at this spot, and for several miles above and below, consist partly of sewage. The sanitary condition of this part of the river has probably suffered, but for navigation purposes its condition has improved.

CHARGE OF 'COOKING' VACCINATION STATISTICS.

AT a recent meeting of the Leeds Board of Guardians it was decided to address an official letter to Mr. Councillor Kenworthy, asking for an explanation of his assertion at a public anti-vaccination meeting held in front of the Leeds Town Hall, that the small-pox statistics kept at the Leeds Small-pox Hospital, were 'cooked' in favour of vaccination. Mr. Kenworthy was asked either to prove his assertion or to offer an apology for the aspersion passed upon the board of guardians and their medical officers. In order that every opportunity should be forthcoming for clearing up the points in dispute, it was arranged that the books at the Small-pox Hospital should be open to the inspection of all the members of the board, and of any others who might care to examine them. From the discussion which took place on this affair, it is evident that the anti-vaccinators on the board are in a very small minority. At the last meeting, however, of the Keighley Board of Guardians, the anti-vaccination guardians were able to pass, with the help of the chairman's casting vote, a resolution which amounted to a vote of want of confidence in a report on the subject of small-pox and vaccination, presented by the medical officer of the workhouse, and relating to a hundred consecutive cases of small-pox which had been under his care in the workhouse hospital. The statistics proving that the mortality had been six times as great among the unvaccinated as among the vaccinated was the cause of the rejection of the report. At the same meeting of the Keighley Board of Guardians, Dr. Macnab, a public vaccinator, resigned his appointment, because he had attended at his station four times a month during the past year, and he had not had a single child brought to him for vaccination. This result may be clearly attributed to the action of these anti-vaccination guardians, against whom a *mandamus* was recently issued by the Court of Queen's Bench.

THE EFFECTS OF OPIUM SMOKING.

IN reference to the habit of opium smoking among the Chinese one of that people writes to the *Times* of July 6, and *inter alia* speaks as follows of the effects of opium smoking.

'As a Chinese, I can testify to the innumerable instances in which my poor countrymen have been entirely ruined through the use of the poisonous drug, and I fear I should weary your readers if I were to give a lengthy account of their misery. Suffice it to say that opium undermines the health, saps the physical strength, and blights the moral sense of millions of my countrymen. For want of money to buy the drug—the price of which is very dear in my country—many of its victims have been led to commit thefts and other crimes. Its votaries are not the only sufferers, but their children, inheriting their blood, present the melancholy appearance of being pale and sickly, in great contrast with those healthy and robust youths whose parents are happily not its victims. It has, however, been alleged with some plausibility that opium may be and is used in moderate quantities without any ill effects ensuing. This conclusion has been arrived at by some persons in consequence of having observed no apparent change in a few opium smokers. They had been under the impression that a confirmed opium smoker would in every case be weak and sickly, and present a deplorable figure, and because they happened to see some cook, pilot, or sailors—being regular opium smokers—who could still do their usual work, they at once jumped at the counter idea that the habit of opium smoking "can and does exist, without detriment to health or capability, merely affording a solace and a stimulant." Now, being a Chinese, from my experience and personal observation gained by my coming into contact daily with a large number of my friends and relatives who, I am sorry to say, are opium smokers, I am enabled to say that such a conclusion is wrong, and is likely to lead others to the same erroneous idea. I hold, and even the opium smokers admit, that the use of opium, except for medicinal purposes, is invariably more or less injurious, according to the physical constitution of the smoker, and in proportion to the quantity taken. One smoker may not be so bad as another, but he is affected somehow and in some degree. A smoker of strong constitution may still be able to perform his daily work as usual, and to all outward appearances no noticeable change can be perceived in him; but examine him closely, and you will detect there is a change: question him, and he will tell you that he does not feel so well as he was before he became a smoker. But assuming that the habit of smoking a moderate quantity daily can exist without detriment to health or capability, which I deny to be the case, it is mischievous and dangerous in this way—it incites the moderate smoker to constant increase, and inevitably leads him to ruin. A beginner might commence with one pipe a day, but after one week or two you would find that he required two, and in about a month or six weeks he could not do, perhaps, without a daily allowance of five pipes. Thus it is difficult for an opium smoker to abide by his fixed allowance. I do not say that this is impossible, for there is a saying with us, "Nothing is impossible in this world, only men's minds are not firm enough to achieve it." This maxim applies exactly to the opium smoker. But show me one instance where a man had been adhering to a fixed allowance of opium with which he had commenced ten years ago, and I will show you a hundred cases where men began with a very moderate quantity, but within ten years they increased their allowance to such an extent that they were ruined.'

SEWAGE FARMS.

[THE information which the writer of the following letter to the *Times* has been at such pains to collect is interesting, but for all practical purposes the returns are useless, inasmuch as a mere statement of receipts and expenditure prove nothing; and unless the amount of expenditure which should be charged to capital account, and which to current expenses, were shown, the return becomes misleading and worthless.

In the Croydon farm, for instance, there is an apparent deficit of 1,955*l*. If this deficit were dissected it would be found that the great bulk of it would be fairly chargeable to capital and permanent improvement account, which should be extended over the whole term of years. From Dr. Carpenter's statement the legitimate current expenses are balanced by the receipts. The sum charged to capital account, therefore, should be increased by the 1,955*l*.

We have instanced Croydon, but no doubt the same remarks will apply more or less to all, and the natural error which the *Times* correspondent has fallen into arises from the confused manner in which the accounts are kept. Regarding this letter, Mr. Hope, a great authority on sewage-farming, writes, 'Whether any of the so-called "facts" in the particular return alluded to happen to be true I of course cannot pretend to say, but this I can and do say, that the return is absolutely false as regards every town the details of which I happen to be acquainted with, and specially false and misleading with regard to the town

of Romford, with which I have the misfortune to be connected.

'The sewage of the town, if treated as a pestilential water to be got rid of, is not likely to bring in a very large return; but if treated as a liquid manure and intelligently applied, it cannot but pay a handsome return upon any reasonable expenditure.']

The following is the letter in question:

'The distress in which the towns of this country are placed to dispose of their sewage appears to be almost hopeless. No relief has been brought by the several companies which have offered remedies to the towns, while the companies themselves are quoted in your share list daily as not having paid dividends. I have consulted a Parliamentary return issued in 1873, to see what has been the result of sewage farms, and have compiled the following table which appears to be remarkably instructive. It would be desirable to know if the facts here stated have undergone material changes since 1873.

'Working of Sewage Farms which have been one year and upwards in operation, compiled from the Parliamentary Return, No. 134, ordered to be printed April 1, 1873.

Town.	Cost of Land and Works	Total Expenditure on Farm for last year	Receipt for same year
	£	£	£
Altrincham	3,087	462	383
Ashby-de-la-Zouch	*	662	122
Banbury	28,400	1,554	1,309
Bedford	6,997	1,931	1,558
Bury St. Edmunds	2,800	391	150
Braintree	3,000	284	92
Cheltenham	18,000	1,363	975
Chorley	9,785	1,556	625
Croydon	29,214	6,863	4,908
Epsom	2,898	1,520	—
Eton	20,000	1,695	399
Harrogate	—	315	145
Harrow	4,300	450	142
Maidenhead	—	190	131
Ormskirk	1,342	1,088	988
Reigate	2,462	357	160
Romford	19,816	2,482	913
Rugby	6,938	1,241	736
St. Nicholas	—	45	—
Swindon	50	412	424
Tunbridge Wells	85,720	4,432	3,051
Warwick	10,700	796	2,106
Watford	1,440†	396	324
Wolverhampton	30,000	1,880	750
Wrexham	450	736	501

Town	Profit	Loss	Years in Operation	Population last Census	Cost per Head on Yearly Working
					s. d.
Altrincham	0	79	2	8,478	0 2½
Ashby-de-la-Zouch	0	540	2	4,200	2 6½
Banbury	0	243	4	11,718	0 5
Bedford	0	373	4	16,351	0 5½
Bury St. Edmunds	0	241	6	14,928	0 3½
Braintree	0	192	1	4,790	0 9½
Cheltenham	0	388	2	45,000	0 2
Chorley	0	931	3	13,000	1 5
Croydon	0	1,955	14	52,500	0 8½
Epsom	—	1,520	3	6,276	4 10
Eton	0	1,296	1	3,800	6 9½
Harrogate	0	170	3	6,000	0 6½
Harrow	0	308	3	5,010	1 2½
Maidenhead	0	59	1	6,137	0 2½
Ormskirk	0	120	3	6,000	0 4½
Reigate	0	197	1	15,914	0 3
Romford	0	1,569	4	6,335	4 11½
Rugby	0	505	3	8,400	1 2½
St. Nicholas	0	45	—	1,200	0 9
Swindon	12	0	5	4,092	—
Tunbridge Wells	0	1,381	3	19,410	1 5
Warwick	1,310	0	4	11,001	—
Watford	0	72	1	7,461	0 2½
Wolverhampton	0	1,130	2	68,237	0 4
Wrexham	0	235	2	8,537	0 6½

* Lease at 200*l.* per annum. † Rent, 44*l.* per annum.

'Thus, out of twenty-five places, only two show a profit. Warwick presents a remarkably exceptional result, and would appear to be the only case where not only a profit, but a large profit has been made on a sewage farm. The following are the additional facts concerning Warwick, which are given in the Parliamentary return:—The authority conducting the works at Warwick is the board of health. The farm consists of 135 acres, being 1·23 acre to 100 of the population. The farm is on stiff clay and clay subsoil. The average annual rainfall is twenty-six inches. The land is held upon lease for twenty-one years; cost of laying out the land about 700*l.*; cost of sewers, pumping engines, etc., 10,000*l.*; "other expenditure" is put down at 796*l.* 13*s.* 4*d.* for the year. But it is not stated if the interest on the loan "about 500*l.* per annum" is included, The sum of 2,106*l.* 14*s.* 8*d.*, as receipts for the year "includes actual returns (not shown) and estimated value of crops."

'Lord Rosebery, just before the prorogation of Parliament, moved for returns to show the profit and loss in the treatment of sewage in all the different ways now practised, which will be most valuable when they are published. In the meantime, the publication of the above table will be useful.'

The Healty of Watering Places.

X. WEYMOUTH.

THE boundaries of Weymouth as a municipal borough, a Parliamentary borough, and a local board district are identical. These boundaries include the two entire parishes of Weymouth and Melcombe Regis, and portions of the parishes of Wyke Regis and Radipole. The population of the borough of Weymouth in 1851 was 7458, and increased during the following ten years to 11,383, the increase during the decade 1851–61 being equal to 20·4 per cent. At the last census, in 1871, the population of the borough of Weymouth was returned as 13,259, and showed an increase of 16·4 per cent. upon the number in 1861. The rate of increase of population in the borough during the ten years 1861–71, was not so great as in the previous decade. Assuming that the rate of increase which prevailed between 1861 and 1871 has since been maintained, the population of the borough in the middle of the present year may be estimated at 14,147 persons.

The Registrar General, in his Annual Watering-place Table, takes the registration sub-district of Weymouth to represent the borough and watering place; and as we shall be in great measure dependent upon the statistics of the sub-district for the means of estimating the sanitary condition of the borough, it will be well first to note how far the area of the registration sub-district differs from that of the borough. The sub-district includes the whole of the borough except the municipal portion of the parish of Radipole, which is situated in the Upway registration sub-district, and had a population of 719 persons in 1871; on the other hand, the sub-district includes the ex-municipal parishes of West Chickerell and Fleet, which had 812 and 166 inhabitants respectively in 1871, and the ex-municipal portion of Wyke-Regis parish, which then had a population of 1,186 persons. In short, the sub-district at the last census excluded 719 of the population of the borough, whereas it included 2,164 persons living outside the borough. There is no reason to believe that this difference of boundary interferes to any considerable extent with the value of the sub-district mortality figures as affording evidence of the sanitary condition of the borough. It may be mentioned that the estimated population of Weymouth sub-district in the middle of this year is 15,564, and 1,417 in excess of the estimate for the borough before mentioned.

Previously to considering the recent mortality statistics of Weymouth sub-district, it will be useful briefly to glance

at the birth-rate, as this affords the means to judge whether the assumption that the rate of increase of population which prevailed between 1861 and 1871 has since been maintained, is thus supported. During the ten years 1861–70, the average annual birth-rate in Weymouth sub-district was equal to 32·2 per 1,000. In the four years 1871–4 the birth-rate calculated upon the estimated population has been successively 29·6, 28·6, 27·1, and 26·3 per 1,000. This steady decline in the birth-rate is hardly consonant with an increasing population. Not only has the birth-rate declined when measured by the population, but the actual number of births registered has also declined; the annual number in the ten years 1861–70 averaged 444, whereas the births in the four years 1871–4 declined to 437, 428, 410, and 404 respectively. This examination of the birth-rate suggests that the population of Weymouth has actually declined since 1871, instead of having increased as has been assumed; otherwise the decline in the number of births registered would have to be accounted for in some other way. The truth as to this appearance of decline in the population of Weymouth can only be ascertained by local investigation; in the mean time, however, it should be borne in mind that, if the population of Weymouth be overstated, the birth and death-rates calculated upon this estimate would both be, to some extent, understated.

The average annual rate of mortality in Weymouth sub-district during the ten years 1861–70 was 21·8 per 1,000. It should, however, be remembered that the Weymouth union workhouse is situated within the Weymouth borough and sub-district, and therefore a correction should be made in the deaths registered within the sub-district, by deducting those of paupers in the workhouse who had been admitted to that institution from the rural portions of the union. Failing a special return of the deaths of paupers showing the parishes from which they were admitted, this correction can only be made in a rough manner. During the three years 1872-3-4, the proportion of deaths registered in the workhouse to the total deaths in the union of Weymouth was equal to 5·7 per cent. After deducting the workhouse deaths from those in the sub-district, and adding 5·7 per cent. for the workhouse deaths belonging to the sub-district, the average annual rate of mortality in the ten years 1861–70 is reduced from the 21·8 per 1,000, mentioned above, to 18·9, which more correctly represents the death-rate during that period. During the past four years of the current decade, 1871–4, the rate of mortality in Weymouth sub-district, after correction for deaths in the workhouse was 21·8, 16·5, 13·4, and 20·4 per 1,000 respectively. Thus in the four past years the death-rate has averaged 18·0 per 1000, and has been 0·9 below the average rate in the preceding ten years. In explanation of the considerable variation between the death-rates in Weymouth during the past four years it may be noted that the town suffered from an epidemic of small-pox in 1871, and that both measles and scarlatina were fatally prevalent in 1874, whereas the zymotic rate was remarkably low both in 1872 and 1873.

We will now proceed to examine in greater detail a few of the more important features of the Weymouth mortality statistics during 1874. The deaths from all causes in the registration sub-district in the year, after correction for the workhouse deaths, of paupers admitted from outside the sub-district, were 313, and equal, as before stated, to 20·4 per 1,000, against 16·5 and 13·4 in the two preceding years. These deaths included forty-seven which were referred to scarlet fever, seventeen to measles, eleven to diarrhœa, five to diphtheria, five to different forms of fever, two to whooping-cough, and not one to small-pox; in all eighty-seven deaths resulted from these seven principal zymotic diseases, against but fourteen and ten in the two preceding years. The deaths from these seven diseases in 1874 were equal to 27·7 per cent. of the deaths from all causes, and a rate of 5·7 per 1,000 persons estimated to be living in the sub-district. In the nine watering places previously discussed in these columns, the deaths referred to the principal zymotic diseases during 1874 showed a percentage to total deaths, which ranged from 5·6 in Eastbourne to 28·8 in Yarmouth; the death-rate per 1,000 from these diseases was but 0·9 and 1·5 for Eastbourne and Ramsgate, while it was equal to 2·9 and 6·4 in Lowestoft and Yarmouth. The zymotic death-rate in Weymouth during 1874 was higher than in any of these nine watering-places, except Yarmouth. During 1871, when small-pox was epidemic, the death-rate from these seven diseases in Weymouth was as high as 6·2 per 1,000, while in 1872 and 1873 it did not exceed 0·9 and 0·7 respectively. Scarlet fever, which had caused but two deaths in Weymouth during the three years 1871–2–3, became epidemic in the spring of 1874; of the forty-seven deaths referred to this disease during that year, two occurred in the March, twenty-three in the June, thirteen in the September, and nine in the December quarters. It may here be noted that only one death from scarlet fever was registered in Weymouth during the six months ending June 30 last, and this occurred in the first three months of the year. No death from measles was recorded in Weymouth during the three years 1871–2–3, whereas the disease became fatally prevalent during the first quarter of 1874, causing fifteen deaths; one fatal case was recorded both in the second and the third quarters of the year. The five fatal cases of diphtheria also exceeded the numbers returned in the three preceding years, and included two in the first and in the last quarters of the year. Of the five deaths referred to fever one each occurred in the first three quarters of the year, and two in the last three months; during the past four years the deaths from this disease have averaged rather more than four per annum, and have been equal to an annual rate of but 0·28 per 1,000. The fever death-rate in England and Wales during 1874 was equal to 0·56 per 1,000, or just double the average rate in Weymouth during the past four years. In the last quarter of 1874 two deaths in Weymouth were referred to whooping-cough, no death from this disease having previously occurred since the first quarter of 1872. The eleven fatal cases of diarrhœa included three in the second, five in the third, and three in the fourth quarters of the year; the five in the third or summer quarter were equal to an annual rate of 1·3 per 1,000. During the summer quarter of 1874 Eastbourne enjoyed a complete immunity from fatal cases of diarrhœa, whereas the death-rate from this disease in the eight other watering places ranged upwards from 1·2 in Hastings, to 4·9 in Margate.

Infant mortality, measured by the proportion of deaths under one year of age to births registered, was equal to 126 per 1,000 in Weymouth during 1874, against 144, 107, and 95 in the three preceding years. Infant mortality in England during 1874 averaged 151 per 1,000, whereas in the nine watering-places previously referred to it ranged from 113 in Ramsgate, to 158 in Lowestoft. The increase of infant mortality in Weymouth during 1874 was principally due to the prevalence of measles in the first quarter of the year.

At the last census, in 1871, of the 14,704 persons enumerated in Weymouth sub-district, 1,273 or 8·7 per cent. were aged sixty years and upwards; this proportion somewhat exceeded that which prevailed in most of the other watering places, the excess being probably due to the situation of the union workhouse within the sub-district. Assuming that the proportion of persons aged over sixty years in Weymouth is the same now as it was in 1871, the number of persons living in the sub-district at these ages in the middle of 1874 may be estimated at 1,330; the seventy-five deaths of persons aged sixty years and upwards during the year were, therefore, equal to a rate of 56·4 per 1,000, which was 15·6 below the average rate in England and Wales. The death-rate at these ages in each of the nine other watering places exceeded that in Weymouth, and ranged from 56·6 in Lowestoft, to 67·1 in Eastbourne. It may be noted that the death-rate among elderly persons in Weymouth has steadily declined during the four years 1871–74.

It will be well now briefly to note the mortality figures

which have been published in the Registrar General's quarterly returns for Weymouth relating to the first two quarters of this year. During the first three months of this year the death-rate in Weymouth sub-district was equal to 26·1, and in the three months ending June to 16·0 per 1,000 of the estimated population; a correction has been made in each of these rates for the deaths in the workhouse of paupers who had been admitted from outside the sub-district. The deaths in the six months exceeded by twenty-seven the average number in the corresponding period of the three preceding years; the increase was, doubtlessly, in great measure due to the inclemency of the winter and spring, which in all parts of England caused an increased fatality, especially among elderly persons. The proportion of deaths of persons aged sixty years and upwards to total deaths in Weymouth sub-district, which had been but 29 per cent. in the first six months of the three years 1871–73, rose to 37 per cent. in the corresponding period of this year. The deaths referred to the seven principal zymotic diseases were thirteen in the first and six in the second quarter of this year; these deaths were equal to annual rates of 3·4 and 1·5 per 1,000, showing a further decline from the numbers returned in the last three quarters of 1874. The fatal cases of whooping-cough which had been two in the last three months of 1874, rose to eleven in the first quarter of this year, but declined again to two in the three months ending June last. In the first quarter one death each was referred to scarlet fever and fever; while in the second quarter the deaths included two from measles and one each from diphtheria and diarrhœa. It appears, therefore, that the death-rate from zymotic diseases, which showed a considerable excess during 1874, has continued to decline since the beginning of the year, although it continues higher than that which prevailed during 1872 and 1873. As bearing upon the health of Weymouth in the second quarter of this year we may refer to the figures with which we were favoured by Dr. Tizard, the medical officer of health for the borough, and which were published in our Watering-place Table a week or two since. The annual death-rate from diseases of the respiratory organs in the spring quarter of this year in Weymouth was equal to 4·0 per 1,000, against 3·3 in the aggregate of the thirty-one watering places furnishing the information; the rate from phthisis was 2·0 per 1,000 in Weymouth, against 2·5, the average rate in the other watering places.

In drawing this analysis of the recent vital statistics of Weymouth to a conclusion, a few words as to the practical application of the figures may not be out of place. There is every reason to conclude that the natural salubrity of the place is of a very high degree, and if we for a moment exclude the deaths from the principal zymotic diseases we find that the death-rate per 1,000 of the population during the four years 1871–74 has averaged so low as 14·7 per 1,000. This rate is remarkably low, especially for a watering place that has some of the attributes of a port. Infant mortality, too, if we exclude the deaths of infants from zymotic diseases, is low in Weymouth, and the death-rate among elderly persons considerably below the average. The only unfavourable feature in the examination of these figures is the high rate from zymotic diseases, and this deserves the most serious attention on the part of the Urban Sanitary Authority and their medical officer of health. The zymotic rate in the four years 1871–4 was equal to 3·4 per 1,000 in Weymouth sub-district, and to 23 per cent. of the death-rate from all causes. This great fatality from zymotic diseases was, it is true, due to the epidemic of small-pox in 1871, and to the prevalence of scarlet fever and measles in 1874; the very fatality, however, of these epidemics affords the strongest evidence that the sanitary defences of the place are far from perfect. No communities in these days, more especially in watering places, can avoid chance importations of zymotic disease into their midst, but these chance sparks of infection only lead to conflagrations when they fall upon inflammable materials. We would advise the local authorities to seek seriously for the causes of these epidemics, which are as fatal to the reputation of watering places as they are to the lives and health of their inhabitants. A local investigation would propably reveal the fact that the majority of the fatal cases of small-pox in 1871, and of scarlet fever and measles in 1874, occurred in the same localities; should this be the case what better indication could be desired of the parts of the town which need sanitary improvement? We have reason to believe that the urban sanitary authority of the borough has, up to the present time, neglected to provide itself with hospital accommodation for the isolation and treatment of infectious diseases, without which no sufficient precautions can be taken against the recurrence of these zymotic epidemics. It would be satisfactory, moreover, to know what precautions have been taken since the small-pox epidemic in 1871, to prevent the future neglect and apathy in the matter of vaccination to which the fatality of this epidemic was in great measure due. This is a matter which unfortunately does not, as it should do, come within the province of the medical officer of health, but is one on which he should doubtlessly keep himself well informed.

Given the usual success which attends earnest and well-directed efforts to control the mortality from preventable disease, there is every reason to believe that Weymouth would take a high place among the very healthiest of English sea-side health resorts. To secure this result, however, the water-supply should be above suspicion and constant; the sewerage system as near perfect as it can be made as regards outfall and ventilation; and the urban sanitary authority should possess ample hospital accommodation for infectious diseases, under its own control. When will Weymouth be in a position to declare that it possesses all these securities for health?

Weymouth consists of the old town of Weymouth proper, and of Melcombe-Regis; it is the latter which faces the shore in a long graceful curve, and which is known to visitors as Weymouth. It is completely sheltered from the west by the Isle of Portland, which, breaking the great swell of the ocean, renders the bay of Weymouth remarkably calm. There are particularly good slowly shelving sands for bathing, with plenty of bathing machines. There is also an excellent bathing establishment, where baths of any temperature may be had. Weymouth faces the east, and as on that side there is no shelter, bathing is discontinued perhaps a little earlier in the season than in some other places.

The climate is a good deal more western than that of the places which we have hitherto visited; that is, it is milder and moister, and suited for such people as find the air of Folkestone or of Margate too 'strong' for them. Weymouth has been so long established, and enjoyed the patronage of royalty for so considerable a period, that there are abundance of excellent houses, and there are few watering places where one can live more comfortably. It seems to be in most repute in the West of England, and it is a favourite resort of the people of Bath and Bristol. There are two weak sulphur springs close to Weymouth, at Radipole and at Nottington. They were brought into notice when the continent was shut against us, and when English mineral waters were in great request. As they do not contain two grains of common salt, and only one grain of sulphate of magnesia, and not one sixteenth of a grain of bicarbonate of iron in the pint, they never could have been of any real value. This quantity of sulphuretted hydrogen cannot be considered to be sufficient to act in any way. However, people generally have faith in any water that smells of sulphur, and they used these waters for many years; but they were gradually employed less and less, and the Spa of Nottington has been shut up for the last two years. Radipole is partly closed; that is, baths of the water are done away with, and there is only a drinking shed erected in their place. The water varies in strength, as many of the less important sulphur ones do, being stronger when the weather is dry, and more diluted

when there are heavy rains. We do not see much prospect of the revival of the use of these waters.

Weymouth is one of the starting points for the Channel islands, which enjoy pleasant moderate climates. The walk along the esplanade is very fine, owing to the sea view which it commands. There are usually many ships and yachts at anchor inside the breakwater of Portland, and it is a frequent anchorage for men-of-war.

Numerous sailing excursions can be made. Steamers take you to Portland Bill and to the picturesque little Lulworth Cove. The island of Portland, its quarries, and fossils, and the convicts are objects of interest. The curious lagoon formed by the Chessil bank, and extending for eight miles, is well worth examining. There are more distant excursions to Dorchester, to Corfe Castle, and to Sherborne Castle. A visitor, who goes about the district, need not find time hang heavy on his hands at Weymouth.

We may now return to the consideration of sea-bathing.

Coming next to consider shortly the diseases which are relieved by sea-bathing, we are in the first place struck with the little systematic knowledge of the subject to be found in books. It has been for a long series of years the fashion in all parts of the kingdom for families of all ranks, that can afford it, to go to the sea-side for bathing, and most of them bathe without discriminating for which members of the family sea-bathing is appropriate, and for which it is the reverse. On such subjects advice is scarcely ever asked for from a doctor on the spot.

One of the great causes for which the sea-side is visited, is to promote convalescence after acute, and especially after attacks of zymotic disease—such as scarlet fever, measles, typhoid, whooping-cough, etc. In such cases, sea-air is looked to as much as, or more than, sea-bathing. A great many weak and delicate children are also sent to the sea-side, who labour under no particular malady, yet who do not thrive, and whose general nutrition is imperfect. The former class almost always recover more rapidly than if they had stayed at home, and the other class often improve much, when their stay is a prolonged one. Artisans and those who have been shut up in manufactories, improve quite astonishingly on a short visit to the sea-side, which, with them, always includes sea-bathing. Almost all who have had much office or much head work derive benefit from a change to the sea-side.

Foreigners are much in the habit of sending patients to the sea-side, after a course of mineral waters, especially after continued warm baths. It is regarded as tonic, and an alternative for steel waters or for mountain air. English have so little systematic mineral-water treatment that this use of the sea-side scarcely applies to them.

Sea-bathing is especially useful in early life; anæmic conditions of children and chlorosis are often relieved by it. But in the case of chlorotic girls, care must be taken that they are not too weak for cold baths—that their power of reaction is sufficient. If it be defective, they will only suffer from cold sea-bathing.

In a great many affections of the nervous system and in those akin to them, called hysterical, sea-bathing is often highly advantageous—for instance, in paralysis after diphtheria or typhoid—particularly so in nervous aphonia or loss of voice; it is extremely useful in the condition which passes by the name of spinal irritation, and is frequently so in the incontinence of urine in children. Physicians of some experience are able to talk confidently of its use in many cases of sciatica, in some of facial tic, and occasionally in purely nervous headache. In catarrhal affections of the respiratory organs, sea-air and sea-bathing are often very useful; also in chronic bronchitis—frequently in asthma, so far as it is connected with bronchial catarrh. Nothing helps more to cure the tendency to constantly catching cold, or to harden the skin, than open sea-bathing. We may perhaps say generally, that in the case of those who are of consumptive families, and who live in inland parts of England, a residence at the sea-side is like a sea voyage, useful in threatened tuberculosis. They may often benefit by sea-water warm baths, and even bear a little open bathing in the height of summer. This, of course, is subject to various limitations, and to the circumstances of individual cases.

Children are often cured by sea-bathing from their troublesome recurring attacks of pseudo-croup, and from the dregs of whooping-cough.

It is doubtful what amount of benefit dyspepsia derives from sea-bathing. Usually the change to the sea-side gives temporary relief. As to the more important and deep-rooted affections of the alimentary canal, open sea-bathing is generally a doubtful measure, only to be adopted with caution.

In some of the more chronic forms of rheumatism and of gout, marked benefit is often got from sea-bathing.

But sea-air and sea-bathing are the remedies *par excellence* of scrofula in its various forms, a fact recognised by the institution of hospitals for such cases at places like Margate (in England) and Berck (in France). Our own impression is that in this country salt water is scarcely sufficiently used in scrofulous cases in the various modes in which it may be applied. Chronic scrofulous affections of the joints and ulcerations certainly do better at the sea-side than elsewhere, and particularly many cases of children with troublesome ozæna or otorrhœa experience great relief.

Sea-bathing, judiciously employed, is of very great value in the treatment of many, and often very different conditions of the female system; but here especially the treatment must not be indiscriminate, but systematic and careful.

Parliamentary Proceedings.

HOUSE OF LORDS.

(*Wednesday, August* 11.)

ROYAL assent was given by commission to the following bills:—

Public Works Loan; Pharmacy; Public Health; Sale of Food and Drugs: Metropolitan Board of Works (Loans); Chimney Sweepers; Public Health (Scotland) Act (1867) Amendment; Lunatic Asylums (Ireland); Local Government Provisional Orders Confirmation (Leyton, etc.).

MISCELLANEOUS.

THE Public Works Loan Bill as amended was read a third time and passed.

The Commons' amendment to the Local Government Boards Provisional Orders Confirmation (Abingdon, Barnsley, etc.) Bill was agreed to.

The Sanitary Law (Dublin) Amendment Bill, which the Duke of Richmond said was intended to secure funds for the main drainage of Dublin, was read a third time and passed.

The following bill passed through committee: Local Authorities Loans, Sheriff Substitute (Scotland).

Law Reports.

BAD MORTAR.

AN important and curious case has been dealt with at the Hammersmith police-court. T. Eyers has been summoned by the district surveyor, with respect to the quality of mortar used in the construction of houses in Gratton Road.—Two samples were produced, it being stated that they contained 20 per cent. of sand and 80 per cent. of loam. The defendant had been cautioned for using mould. —The defendant said they were not fair samples.—Mr. Knightley explained that the lower part of the wall was built with the bad mortar, but a better description was

used for the upper portion.—The defendant urged that he used lime, sand, and the refuse of a brickfield in equal proportions to make the mortar hold.—Mr. Ingham left the bench to inspect the work, and on his return made an order for the wall to be pulled down in seven days.—The defendant declared that he should take the case to another court. If local board surveyors were a little more active in matters of this kind, they would very often be able to render good service to the public, especially occupiers of new houses.

LONDON MEAT.

AT Guildhall, E. M. Smith, butcher, of Sutton St. Edmund's, Cambridgeshire, was summoned before Alderman Owden for sending unwholesome meat to London. Mr. Baylis prosecuted for the Commissioners of Sewers; at the latter end of June a farmer named W. Smith had a calf suffering from inflammation of the brain. It was treated by a veterinary surgeon, who said that the medicine he had given would not affect the meat, but recommended that it should be slaughtered. The defendant was sent for to buy the calf but he declined. It was then arranged that the defendant should kill the calf and do the best he could. He sent it to Mr. Bonsor, in the Metropolitan Meat Market, and Williamson, his foreman, called the attention of one of the inspectors to the carcass, which was seized and condemned. The meat was inflamed and unfit for human food. Alderman Owden considered that W. Smith was as bad as E. M. Smith, for it was evident that the meat was sent up by mutual consent. If he had the two Smiths before him he would fine them both. He then fined the defendant 10*l.* and two guineas costs, or one month's imprisonment.

BERMONDSEY MILK.

S. KEMP, of the 'Model Dairy,' St. James's Road, has been charged with selling milk adulterated with 35 per cent. of water as pure milk. The case came before his worship a week previously, and was adjourned at the defendant's request for the attendance of the cow-keeper who supplied her. F. Joy, in the employ of Phillips, cow-keeper, Lewisham, was called. He said he delivered the milk at the defendant's place on the morning the inspector made the purchase. The defendant told him it looked poor, and handed him some in a bottle to take back to his master. Witness knew that the milk was a little poor, as the cows had had a change of food. Mr. Benson asked him whether his master had the milk analysed. Witness replied no, but his master had sent it to his worship to look at. Mr. Benson told him he could not analyse it, but Dr. Muter had done so, and pronounced it adulterated with 35 per cent. of water. Mr. Edwin, in defence, said that his client sent the milk to Phillips, so that he might have an independent analysis. He had not done so; therefore he trusted the magistrate would not deal harshly with his client, as she had never been convicted. Mr. Benson fined her in the mitigated penalty of 2*l.* and 12*s.* 6*d.* costs.

CHIMNEY SWEEPERS.

LORD SHAFTESBURY has, during the past session, again played the part of a philanthropist, this time to plead for a class of workers whose work we had hoped and supposed had long since ceased—namely, boy chimney-sweeps. His lordship published a letter in the *Times* respecting chimney sweeping at Liverpool, which certainly contained some startling revelations made by a member of the town council. This gentleman, Mr. A. B. Forwood, 'asked if the attention of the committee had been called to some proceedings before the magistrate, with reference to sending boys up chimneys at the Town Hall. He found that this practice was very frequently adopted in Liverpool, and it was only the previous day that he heard of a boy having been employed in a private house to clean no less than six chimneys. Each time the little fellow came down he was so exhausted that restoratives had to be applied before he could ascend another flue, and when the owner of the poor boy brought in his account, the bill for cleaning the six chimneys amounted to 4*l.* 10*s.*, being 15*s.* for each chimney. The man was remonstrated with for such an extravagant amount, but his reply was, "Oh, you have been offending against the law, and so have I, and I must be paid for the risk." The system was a cruel one, and looking to the number of magistrates who sat at the council board, and to the position of the corporation, they ought to be the first to show an example in keeping the law, instead of being law breakers. Mr. Whitley said he believed there was one flue in the Town Hall which communicated with four chimneys, which it was not possible to work by machinery, and he quite agreed with Mr. Forwood that some steps should be taken to prevent the employment of climbing boys.'

This incident, and some facts of a like sort, determined Lord Shaftesbury to take vigorous measures for putting an end to an abuse which, thanks to his exertions, we hope has now for ever ceased.

BRIEF NOTES OF CASES.

LEGAL PROCEEDINGS.

1875. *New River Company* v. *Mathers.* 'Water Works Clauses Act, 1847,' section 68—Private Act.—Held that as the 'annual value' was disputed, no court had jurisdiction until two justices had determined the value.—Decision reversed. (44 L. J. M. C., 105; L. R., 10 C. P., 442; 32 L. T., 658.)

LIABILITY FOR ACCIDENTS.

1875. *Fisher* v. *Lightfoot and the Mayor of Sheffield.* Dangerous hole in road.—Accident to a cab.—Question whether it was a tramway or a highway repair that was in progress.—Held that the corporation and its contractor were both liable.—Verdict for the plaintiff. (*Times*, April 12, 1875.)

PAVING EXPENSES.

1875. *Nisbet* v. *Greenwich B. W.* Paving Expenses. The apportionment by district board is conclusive, and a magistrate cannot review the principle on which it is made. —(44 L. J. M. C., 119; W. N., 1875, 120; 32 L. T., 762.)

RATING RAILWAY.

1875. *Reg.* v. *Midland Railway Company.*—A railway is none the less rateable as land because rails are laid on it, and signal posts and huts are erected on it. Possibly, however, the huts might be rateable as building.—W. N., 1875, p. 111; 39 J. P. 359. [*Midland Railway Company*, v. *Great Wigston.*] 32 L. T., 753.

POUNDS.

SIR,—You will oblige by giving information in your next issue on the following.

1. Who are the recognised owners of common pounds (the county or parish authorities)? 2. Whether it is indispensable by law that such continue to exist? 3. Can a majority of ratepayers in a parish where a pound is situate decide to dispose of the same, and if so, to what purpose ought the money derived from the sale to be applied?

August 10, 1875. OVERSEER.

[It depends upon circumstances who are the owners of pounds, but most commonly they belong to the parish. In urban districts, the urban authority under 'The Public Health Act, 1872' (see Chambers's *Digest*, 6th ed., p. 57), is responsible for the management of the pound. The question of sale is one within the jurisdiction of the poor law department of the Local Government Board. Ordinarily the proceeds of the sale of parish property are payable to the treasurer of the guardians for the credit of the parish in which such proceeds arise. Our correspondent had better seek the advice of the Local Government Board.

Correspondence.

WATER-SUPPLY IN COUNTRY PLACES.

(*To the Editor of the* SANITARY RECORD.)

SIR,—Though I feel no doubt that your reply to Mr. Thomas's letter at page 118 is quite correct, that it would be illegal to make cottagers pay twopence a week each for water not supplied to their dwellings, but only by public taps conveniently near, it should, I submit, be added that to so charge them would be, even if legal, palpably unjust, for the very sufficient reasons that if water be so supplied it will be much less used than is desirable, and will be exposed to pollution if kept, as it often will be, in open vessels after being drawn, while the extra and needless trouble of going in all weathers out of doors for it would be very badly paid for by twopence a week, or scarcely more than a farthing a day.

I say wholly needless trouble, because the cost of conveying a supply-pipe into each house from that supplying the taps would be so little that the interest of such additional outlay would be repaid by a very small part of twopence a week, or 8*s.* 8*d.* a year, if the engineer would condescend to consider how very minute a pipe is needed to carry the water really used in a house, and if he would be content with a not more costly one than is needed. It is hardly reasonable, however, that engineers paid by a percentage upon what they can persuade their employers to expend, should be very anxious to be economical; that they should take extra trouble to be economical while paid extra for being extravagant. The quantity of water really used in a house seldom exceeds, and often does not reach, twenty gallons a day, though the quantity supplied is often as much or more per head, three times as much being wasted as is used; and the cheapest pipe that can be obtained would supply more than is used, while waste would be confined within moderate limits, if the water were supplied very slowly, say at the rate of a gallon or two an hour into a small receptacle large enough to hold as much water as will be wanted at once, but not much more, which will be gradually refilled before water need be drawn again. A pipe made of lead lined with tin, large enough to supply any house, is to be had at a penny a foot, so that the cost of any moderate length of it would be trifling, while that for the little receptacle needed should not exceed a few shillings. A very convenient form of water-waste preventer is one I proposed twenty or thirty years ago, an air-tight stoneware bottle, the air in which would be compressed as the water entered, and would force the water out by its elasticity when the tap is turned. A three-way tap, to allow the water either to enter or escape, but not both at once, would prevent waste, while allowing as much water to be used as is desirable. A farthing a day, or twopence a week, would be cheap payment for so convenient a water-supply but far less would amply repay the outlay; unless the source of supply be distant or very costly.

If every house be thus separately supplied, there would be no need for the public taps (except, perhaps, for a few drinking fountains), and the taps might be advantageously replaced by hydrants, to which hose pipes for watering and washing the roads, or in case of fire, might be attached, and used whenever water in a large quantity is needed for any occasional purpose; and there is no excuse for adopting the very unsatisfactory mode of supply proposed, namely, by public taps only, by which a very small outlay only can be avoided at the cost of time and trouble of far more value.

P. H. HOLLAND.

MR. TAYLOR, of Holloway, was summoned for neglecting and refusing to have his child vaccinated, and stated that he would not obey any order made.—Fined 4*s.*

Review.

Friendly Societies, and Similar Institutions.

THE sanitary and social condition of a population are so intimately bound up together that it is needless to attempt to ignore the direct effect of prosperity or poverty, and providence or improvidence upon the health of the people. The rapid growth of friendly societies and similar institutions, and their influence upon the welfare of the working classes, is a subject the importance of which, in its innumerable bearings, is far too little understood or studied. The eventual influence of these societies, if judiciously fostered and protected by a certain amount of state recognition and inspection, upon pauperism can scarcely be over-estimated. That so little sound knowledge exists upon this complex subject may be partly due to the voluminous nature of the reports which have from time to time been issued by different friendly societies' commissioners, and even of the annual reports of the registrars of friendly societies. As an introduction to the study of the subject we can cordially recommend a paper which was read before the Statistical Society of London a month or two since by Mr. E. W. Brabrook, F.S.A., F.S.S., which was entitled 'Friendly Societies, and Similar Institutions.' In this paper, which is printed in the Journal of the Statistical Society for June, will be found, not only a most useful collection of facts, judiciously arranged, but some valuable suggestions as to the best position which Government can assume towards the various classes of these institutions.

Some idea may be formed of the extent of this subject, by a glance at the classification adopted in this paper. Friendly Societies, that is, societies under the Friendly Societies Acts, are divided in the reports of the late Commission into seventeen classes. Mr. Brabrook, however, divides his paper into two classes:—A. Friendly Societies, more properly so called; and B. Similar Institutions. Class B. is sub-divided into:—1. Trades Unions; 2. Co-operative Societies; 3. Building Societies; 4. Savings Banks; 5. Loan Societies; and 6. Literary Societies. All these classes of institutions tend more or less to further the social welfare of the working classes, if judiciously and soundly conducted, and so react upon the sanitary condition of the people. Such friendly societies, however, as may be described as sick and burial clubs, are those which have the most direct influence upon the health and death-rate of the classes they are intended to benefit; and this influence has a distinct sanitary value. It is only necessary here to refer to one of these societies in order to show the importance of their transactions. The Ancient Order of Foresters had 468,495 members on December 31 last, and funds to the extent of more than two millions sterling. Mr. Brabrook's paper tells us that the benefit conferred upon members may be 'measured by the fact that relief was granted during the year 1874 on 3,197,366 days of sickness, and on 4,666 deaths.' It appears, therefore, that each member of this society received during the year allowance for an average of seven days' sickness; and further that the rate of mortality was equal to about 10 per 1,000. This death-rate appears to be very low; but its true value could only be ascertained and discussed if the ages of the members could be taken into account. The importance, however, from a sanitary point of view, of the benefit conferred by these societies upon the working classes, by granting them allowances in time of sickness, which enables them to rest and get medical treatment, can scarcely be overrated. With those of the poor who belong to no club or society, illness brings no relief from work without either starvation or pauperism staring them in the face; the result is that too often a slight illness assumes a fatal character, for want of the means to rest from work, which is afforded by sick club allowances. The form of insurance which finds so much favour with the lower classes, and which provides funds for the funeral ex-

penses of its members, has also its sanitary aspect of no little importance. Mr. Brabrook's paper, however, does not afford much information of a statistical character on this branch of the subject; and we need, therefore, only express regret that the present Government did not introduce into their Friendly Societies Act of the present session more stringent restrictions upon the pernicious system of infant insurance in burial societies. This insurance of infants may not, as has been very clearly suggested, directly lead to infanticide; but it is reasonable to suppose that, giving parents a pecuniary interest in the death of their infants, will, in some cases, conduce to culpable negligence, which may influence their probability of living. Mr. Brabrook's paper on friendly societies will prove useful to those who desire a general idea of the extent and importance of this interesting subject.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

BATES, Charles Pope, M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Ramsey Sub-District of the Huntingdon Rural Sanitary District.

COPEMAN, Edward, M.D. King's Coll. Aberd., F.R.C.P. Lond., F.R.C.S., Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the St. Faith, Norwich, Rural Sanitary District.

GANGE, Frederick Abner, M.D. Univ. St. And., M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the No. 2, Sub-District of the Faversham Rural Sanitary District, vice Spyers, deceased.

NEWTON, Lancelot, M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Alconbury and Sawtry Sub-Districts of the Huntingdon Rural Sanitary Districts: 40*l.* and 34*l.* per annum.

OLDMAN, John, M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Huntingdon Sub-District of the Huntingdon Rural Sanitary District: 34*l.* per annum.

SCOTT, Mr. Thomas, has been appointed Clerk to the Walker Urban Sanitary Authority, vice Daglish, resigned.

THORPE, Mr. R. J., has been re-appointed Inspector of Nuisances for the Staines Urban Sanitary District for one year at an increased salary.

VACANCIES.

BLACKBURN. Town Clerk: 1,000*l.* per annum, offices, stationery, etc.; Surveyor: 450*l.* per annum, clerks, office accommodation, stationery, etc. Applications, 31st instant, to C. G. H. Beck, Town Clerk.

CLAY LANE URBAN SANITARY AUTHORITY. Clerk. Application, October 1, to Mr. Mycroft, Clerk *pro tem.*, Clay Cross.

DERBY URBAN SANITARY AUTHORITY. Surveyor, and Surveyor to the Corporation: not exceeding 500*l.* per annum, office accommodation, and services of a Clerk. Application, 31st instant, to Joseph Jones, Clerk to the Authority, and Town Clerk.

ELY URBAN SANITARY AUTHORITY. Surveyor and Inspector of Nuisances.

GODMANCHESTER URBAN SANITARY DISTRICT. Medical Officer of Health.

PENISTONE, YORKSHIRE. Certifying Factory Surgeon.

RHYMNEY URBAN SANITARY AUTHORITY. Clerk.

VENTNOR URBAN SANITARY DISTRICT. Surveyor and Inspector of Nuisances: 130*l.* per annum, office and stationery. Application, 25th instant, to F. W. S. Damant, Clerk to the Authority.

SANITARY PATENTS.

4230. Protecting buildings against fire and for ventilating them and supplying them with steam, also ventilation of ships. W. R. Lake, Southampton Buildings, London. A communication from J. A. Coleman, Providence, U.S.

2389. Improved composition for cleansing and purifying the teeth and for sweetening the breath. John Morce, Finchley, Middlesex.

2544. An improved ventilating apparatus. Samuel Coste, Water Lane, London.

2557. Improvements in apparatus employed in the filtration of water, sewage, and other fluids. Frederick William Grauhan, Bradford, Yorkshire.

2562. Improvements in ventilating dwelling houses and other buildings. John Westmoreland, Liverpool.

2621. Improved methods and apparatus for neutralising and deodorising the poisonous and noxious gases emitted from sewers and drains, and also the sewage matters contained therein. David Gill, Weston-super-Mare, Somersetshire.

2279. Treatment of sewage, etc. Isaac Brown, Elm Croft Grange, Edinburgh, Midlothian, N.B.

ABSTRACTS OF SPECIFICATIONS.

93. Warming buildings. J. F. Mackenzie, Wigan.

A portion of the shell of the cast-iron stove or apparatus is constructed with a series of hollow pyramidical or coned-shaped projections The heat and flame impinging upon the internal, and the cold air upon the external face of these projections. The stove is also intersected by hollow cast-iron tubes or passages, having internal ribs or flanges protruding inwards, and with or without corresponding grooves externally. Cold air to be heated passes through these tubes or passages. Between the chamber containing the stove, and the outlets which convey the warmed air to the building intended to be heated, a perforated screen or mid-feather is placed, so constructed of fire-clay as to present a large extent of that material to the action of the heated air, in its exit from the apparatus. And on the side of this screen furthest from the stove, is a cold-air inlet, with valve or damper, to regulate the admission of cold air, when required to incorporate with the warmed air.

129. Soaps. W. Green, St. Lawrence, Thanet.

This invention consists in the production of soaps possessing emollient and curative properties, by the admixture therewith of a larger percentage than heretofore employed of seaweed or extracts thereof, or similar or equivalent matters, or saponified wheaten flour, or similar matters, together with soluble glass, liquid quartz, silicate of soda, or the aqueous solution of any of the chemical or commercial varieties and forms of silicates of soda or potassa, and other ingredients, as rosin, borax, steatite, etc., which while assisting to give firmness to such soaps will not neutralise the properties of the seaweed or equivalent matters employed; also the production for such purposes of a saponaceous fluid or paste, by the admixture with seaweed or equivalent matters of ingredients as before described, together with saponified or partially saponified farinaceous vegetable, animal, mineral, bituminous, or other cheap or refuse saponifiable matter.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer—not necessarily for publication.

ATHENRY.

MR. ROBERT IRVING, of Athenry, writes to remove an impression which he says exists to the effect that he had written to us reflecting on the conduct and efficiency of the nurses in attendance at the temporary small-pox hospital. There is certainly nothing in Mr. Irving's letter. or in the comment we made thereon, that could lead to such an inference. On the contrary, our correspondent speaks in the highest terms of the nursing staff of the hospital.

Mr. Irving's letters to us have been in reference to a misunderstanding which appears to have arisen between himself and the guardians in respect to his contract for erecting the temporary hospital, but the subject is too much of a personal character for us to deal with it.

HYGROMETRIC TESTS.

THE *Journal of the Franklin Institute* for May gives a mode of preparing a useful hygroscopic paper, by Percy Smith. A bibulous paper is impregnated with a concentrated solution of chloride of cobalt. It is very sensitive to atmospheric variations, being blue in a dry atmosphere, changing to red when the air becomes humid. Four observations a day, made for a year, with every precaution, prove that this paper may be employed to indicate readily and precisely the hygrometric state of the air, and thus to control in a very effective way the hygrometers usually employed.

INSECTICIDE.

ACCORIDNG to the *Industrie Blatter* of Berlin, the use of wild rosemary (*Ledum palustre*) is recommended as a substitute for the well-known Persian powder. This plant, whether fresh or dry, will kill lice, bed-bugs, fleas, moths, beetles, and their larvæ, the maggots and blue-bottles, and probably other insects. It is also the best remedy for mosquito-bites, and the bites of all other insects. A little of the tincture of the plant applied to the bite not only relieves the intolerable itching, but also relieves the pain. If the tincture be mixed with glycerine and rubbed on the skin, it will drive the mosquitoes away. If this be a fact, the plant deserves special attention. It is very probable that it will be able to entirely supplant the expensive and frequently adulterated or counterfeit insect powder. It is most effective when green and in bloom, at which time it should be gathered.

Communications have been received from:

Dr. Henry Bateson, London; Mr. J. C. Melliss, C.E., Coventry; Mr. Francis George Heath, Paignton; Messrs. Smith and Austin, Hertford; Mr. H. Galavite, Paris; Mr. Robert Irving, Athenry; Mr. R. Whiteside Hine, Sheffield; Mr. William Smith, C.E., London; Mr. G. F. Chambers, Eastbourne; Mr. P. H. Holland, London; Dr. R. Domenichetti, Louth; Dr. J. Atkinson Harrison, Haslingden; Mr. Rogers Field, London.

NOTICE.

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Original Papers.

INEBRIATE ASYLUMS OR HOSPITALS.

BY HENRY I. BOWDITCH, M.D.,

Chairman of the Massachusetts State Board of Health.

I FEEL that a duty has been laid upon me by the death of the late Dr. Derby to carry forward any objects he had at heart. Surely, no man I have ever known devoted himself with a more self-sacrificing love or with a more intelligent zeal for a cause than he did to that which we advocate; viz., the improvement of the public health. Any proposition, therefore, made by such a man, and coming to me, as it were, from his open grave, becomes sanctified by death, and not to be refused. Were I now to decline, I should feel that I was recreant to the dying request of a well-beloved friend, and false to his noble example. Would that I could hope to prepare anything that would entirely commend itself to his mature judgment and his literary skill. As a tribute to his dear memory, I dedicate this paper, trusting that it may be of some service to the noble cause of temperance.

THE SUBJECT.

I shall not confine myself closely to the subject proposed by Dr. Derby, although that, viz., the necessity for the State to establish one or more inebriate asylums or hospitals for the cure of drunkards, will be my chief aim. As in my communications made to you on former occasions, I shall divide my present one into several parts, under different heads.

DRUNKENNESS NOW AND FORMERLY.

Drunkenness is one of the roots of all evil to the person, to his family, his friends, and finally to the State at large. It ruins the health of the individual who indulges in it. It fills our prisons with criminals who have voluntarily deprived themselves of reason before their entrance on crime. Our State almshouses are crowded with its direct or indirect victims, and they are a great burden to the tax-paying, temperate people of the Commonwealth. These statements seem truisms—I presume they will be admitted by every one. The records of the police,* of our courts and almshouses fully sustain them. The facts are lamented by all reasonable persons, even if they be temperate users of alcohol themselves. Even literature feels the influence of the avowed or silent anathemas passed at the present day upon this great curse of humanity. We find few poets who now salute in jovial strains the flowing bowl. In order to get any fervent praises of wine, we must go back to those days when to drink deeply was esteemed an honourable feat, and to lie under the table after a dinner rout was not deemed unseemly. Again, there can be no doubt of the truth of the converse proposition, viz., that society at the present hour is permeated by the temperance idea to a degree that would appear ludicrous to our fathers, when drunkenness passed with little rebuke, save from some satirist like Hogarth, of England, or Troost, of Holland, who delighted to show out boldly upon their living canvas the vices of their age. The grossest and most absurd actions were done within the memory almost of our day, and they were met usually only with a laugh, as at a mere practical and natural joke committed while 'in one's cups,' and therefore to be venially dealt with. No one lost caste 'on 'change' or in social life by the performance of acts which would now be deemed disgraceful under similar circumstances. Exact justice, therefore, to the past and to the present times, must, I think, convince everyone that drunkenness prevailed with the consent of the community to a much greater degree formerly than now. Almost all now despise drunkenness, many of us loathe the idea, and would consider the voluntary submission of ourselves to it as an act of the greatest self-degradation. Such being the estimates of drunkenness formerly and now, let us look a moment at our present opinion of the drunkard himself.

SENTIMENTAL REGARD FOR THE DRUNKARD.

On the threshold of this question we meet with a strange anomaly existing in this community. While no one is found to defend drunkenness, we find a very sickly sentimentalism about the drunkard on the part of some persons. Perhaps I might say that, on the part of most people, the opinion prevails that he is almost always a diseased person, and therefore is, under all circumstances, to be treated as an invalid, with that gentleness and forbearance which we exercise toward any other invalid. While admitting this plea of invalidism in certain cases, as, for example, where there is hereditary taint or under the influence of early instruction or neglect, and in certain dipsomaniacs, I deny the legitimacy of the opinion, in a majority of cases of drunken men or women.

TREATMENT OF THE DRUNKARD BY THE LAW.

A stranger anomaly still is the fact, that while the majority of the community have these sympathetic views in regard to the drunkard, the law still holds up its terrors and declares, for example, drunkenness no excuse for crime. It tries, in its imperfect way, to keep the State from harm by means of various penalties, but it does little or nothing toward reclaiming the drunkard from his evil habits. On the contrary, the law generally, after interfering with him, leaves him worse than before. It fines him, and he goes away quite as much disposed to get drunk as he was previously. Nay, more! the public fine has degraded him; his self-respect has been seriously injured by this public censure. As a means of preventing a repetition of the offence, a fine is ludicrously inoperative. But if the man be unable to pay the fine, the matter is still worse; the culprit is then put into confinement in jail, often with criminals, thieves, and desperadoes of all kinds.* Then and there often begins his career of real crime. Moreover, the law at this time deprives the family of the labour of the father, and virtually lets it starve, without a thought of its misery. The law, as thus administered, seems to commit a real crime against the individual, while it defeats its own best endea-

* From 1864 to 1873 inclusive, the yearly average of drunkards noted and recorded by the police of Boston, was as follows:—During first six years, 17,840; during last four years, 19,472. (See 'Report of E. H. Savage, Chief of Police,' p. 57, 1873.)

* For excellent remarks upon this subject, see those by Mr. Savage in 'Police Report of Boston,' p. 50, *et seq.* 1872.

vour to defend the community from the evils of drunkenness. It may, I think, be summarily asserted, that it does harm to the culprit, beggars in some degree the family, and fails in its endeavour to prevent intemperance.

HITHERTO THE LAW HAS MADE NO SYSTEMATIC EFFORT TO CURE THE DRUNKARD AS ONE DISEASED.

Thus we find that the State, by its organic laws, gives not the least assistance to the wretched victim of an all-engrossing vice. Much less does it make any attempt to cure drunkenness as a disease to which some persons are just as liable as they are to consumption or nervous diseases, typhoid fever, etc., all of which complaints are provided for by the establishment of public dispensaries, hospitals, etc.

Meanwhile a certain number of persons in the community have gone in an opposite direction, and, filled with that tenderness for the drunkard of which I have already spoken, seem to forget that his acts of drunkenness are real crimes against society. In order to prevent him from going astray, these persons would prohibit even the temperate and occasional use of any so-called intoxicating drinks. They virtually say to the small band of drunkards—'You cannot resist temptation, and, therefore, the whole community should give up its rights, and we mean to pass the strictest sumptuary law for all of us, in order to prevent you, and a small minority like you, from going astray.

A priori, it seems singular to attempt to prevent the overuse of any article by the few, by shutting off from all persons a legitimate and non-injurious use of the same article. But, in this way, for more than twenty years, the State has endeavoured to prevent intemperance among the few by prohibition to all. Moral suasion, and the early and persistent inculcation of temperance, and fitting institutions for the cure of the drunkard have been, comparatively speaking, lost sight of, in the vain hope of extinguishing one of the strongest impulses implanted in the human frame; viz., a love for some stimulus, whether it be tea, coffee, tobacco, or alcohol, or some other of the numberless stimulants found on every part of the globe. Doubtless some good has been done by prohibitory laws in the rural districts, and in some, perhaps, of the larger towns; but this cannot be said of their influence in the larger cities, where the universal and open disregard of these laws, or the secret, but not less injurious evasion of them, has tended to lower in the eyes of the people their estimate generally of law. Nothing can be more fatal to the best interests of a free state than to pass any enactment whereby the keenest reverence for law on the part of the citizen is lessened.

WHAT SHOULD WE DO UNDER THE PRESENT CIRCUMSTANCES?

From the foregoing remarks it will be seen that, in my opinion, the present treatment of drunkenness and the drunkard by individual citizens and the State laws is, to use the mildest epithet, very imperfect in many respects. What more can be done in the premises? It would be very presumptuous on my part were I to claim that I can propose any measures capable of coping effectually with this enormous evil of intemperance in its blighting influence on the individual and the State. Knowing as my profession teaches me (and modern science fully sustains the idea), the all-powerful influences of social and climatic law, of hereditary taint, and the consequent peculiarities of the individual, I cannot make this claim; but as discussion in a reasonable way is one of the chief sources of progress, I propose to make a few remarks on the following questions, viz.:

1. What is a drunkard, and how does he stand toward the community in a free state?
2. How shall the drunkard be treated?

If I seem to write harshly of the drunkard, it is because of the harshness of truth itself in its application to his crimes toward a long-suffering community.

The drunkard voluntarily deprives himself of his highest attribute of reason. For the time being, he makes himself a mumbling idiot, not only incapable of doing rightly a good action, but often he may be strongly inclined to do the vilest deeds towards those whom he most dearly loves, or to any stranger he may chance to meet. By putting himself in this condition he contaminates the life-blood of a free state, whose very existence depends upon her healthy and honest hard-working men and womanly women. If, then, any individual, of either sex, voluntarily resigns that manhood, or that womanhood, and makes himself, or herself, a wild beast, wallowing perhaps like a pig, in the gutter before the door; such persons should be treated humanely, it is true, but they cannot complain if they be treated decidedly by the sovereign state of which they claim to be members. As they voluntarily resign their reason, and thereby, for a time at least, destroy their power of acting intelligently, in their share of the public work, they surely cannot complain if their mother state sees fit to punish them, by depriving them, until they behave decently and rightly, of those very rights which they virtually discard by intemperance.

DRUNKARDS OUGHT TO BE DEPRIVED OF CIVIL RIGHTS.

I submit, therefore, that drunkards, if they be inveterate in their habits, should be deprived of all civil rights, in the same manner that the idiot, the insane, the high criminal, are deprived of their rights. I think that the law should allow anyone to complain of the habitual drunkard, and on sufficient proof being given of the truth of the allegation before the proper court, said court should decree civil rights to be held in abeyance until a radical cure be effected. The best interests of the State seem to me, even in principle, not only to allow of this procedure, but to absolutely require it as a means of self-defence, if the republic is to continue in a state of purity. I believe the period will arrive when, to be drunk, even in private, will be deemed a misdemeanour, and to appear in public in a state of intoxication will justly be considered one of the greatest of crimes against the good order of the State. Any one public exhibition of this condition of mind will then be considered satisfactory evidence (unless valid proof be procured to the contrary) of habitual drunkenness, and as such will render the offender amenable to those highest penalties which the State can inflict. For example, for one offence in public, I think that such a person should not be allowed to vote, or exercise his civil rights for at least six months, and for a longer time

on a repetition of the offence. This punishment may seem absurd to some, and be opposed by others, as wholly unjust for the amount of injury done to the State. Some earnest defenders of the rights of man will say that the error of once being intoxicated in public would not deserve so serious a deprivation as that of the right to act generally as a man in civil life. There may also be others who, from the way in which they use their own rights, will think that the deprivation of civil rights from a drunkard will have but little force towards his cure. A man who will lie in the gutter drunk is regardless of shame, and what cares he for civil rights? I admit this argument as of some weight as to the efficiency of the punishment, but deny the plea of its injustice. But if this plan fail, what then? Shall we have recourse to a fine, or imprisonment in a jail, as at present, or shall we, in some cases at least, treat the inveterate drunkard as a monomaniac, and place him either voluntarily, or by force of law, in an asylum where, under moral suasion and entire removal from all external temptations, he may be able to recover his manhood—renew, in fact, his whole character, and endeavour to be for ever afterwards an abstainer from every species of intoxicating drinks? That will be his sole hope of salvation. Upon these topics let us have some reasoning together.

Fines, as we have already decided, seem rarely to produce any good effects, and our jails generally prove seminaries of high learning in crime to our drunkards, and bring poverty and wretchedness to their families. All means, at times, would seem to fail of preventing drunkenness and of curing the drunkard. An early training to a manly temperance in our youth is not given; sincere moral suasion in later years is often neglected, and even prohibitory laws, acting upon the whole people, seem worse than useless in some large communities. Drunkenness prevails on all sides. The question constantly arises: What shall be done? Is there no way open for a union of all who love temperance, so that we may escape from this vast evil? For, notwithstanding the drunkard cannot be restrained by any means heretofore used, we must nevertheless not leave him at liberty to indulge in his vile habit. We must bring him, if possible, under his own self-control. In order to do this, he must for a long time, months or years perhaps, be separated from the evil influences to which he has been subjected. For the total reorganisation of his nature, he needs some place of refuge to which he can voluntarily retire, or in which he can be by law placed, provided he be too degraded and cannot make any voluntary effort for reformation. This naturally leads us to the discussion of the question of

INEBRIATE ASYLUMS OR HOSPITALS.—STATE INSTITUTIONS.

Massachusetts has never in its own behalf, as the guardian-mother of every one of its inhabitants, attempted to sustain an asylum or hospital for the radical cure of the drunkard. It has, it is true, sparingly aided from its funds a well-conducted 'Washingtonian Home,' in Boston. This institution has been in operation for the past sixteen years. Quietly, but very efficiently, has it done its most noble work. It has been liberally sustained by private charity, eked out by the small fund annually granted by the State.* During the sixteen years that this institution has been in operation, one hundred and fifty-seven thousand (157,000) dollars have been expended, or a little less than ten thousand (10,000) dollars annually for current expenses. During this period it has treated four thousand two hundred and ten (4,210) persons at a cost of about thirty-eight (38) dollars each.† It is believed that at least one-third of the number have been cured; another third have been greatly improved. One-third have not been permanently changed from their evil habits; but possibly, under increased facilities and every convenience that a great State could provide, a number of this last third might be reclaimed. Surely, this private experiment, in one county of the State, should give encouragement to the legislature to establish other similar institutions to be sustained as works of public necessity. New York has the honour of being the first State in the civilised world that has established and wholly sustained a State Inebriate Asylum.‡ Maryland has recently done the same. Some other States and countries are now earnestly examining the subject.§ England has had its parliamentary committee and report. It has summoned from this country experts upon the matter. Connecticut, Minnesota, and the Provinces of Nova Scotia and Ontario have also had committees on the subject. I am not aware that any movement has yet been made by the legislature of Massachusetts, looking to this desirable end. Massachusetts usually is not laggard in any good work tending to the improvement of her citizens. I feel sure that she will not be in this instance, when once she comprehends its vast importance. As an individual, I take the ground that it is not only the bounden duty, but it is of the highest sanitary, as well as moral, importance to the State, to adopt any feasible method for more thoroughly dealing with intemperance. This vice so saps the health of individuals and of their progeny, that, as a sanitary measure, inebriate asylums could be urged upon the notice of the State with as much reason as common public hospitals were formerly demanded as public necessities.

As a matter of economy in the expenses of the State, the establishment of these hospitals might be urged. A very large proportion, now in our almshouses, are there, either directly or indirectly, in consequence of drunkenness. They are there, and virtually left to themselves. No one seems to care for them; no one endeavours to lift them up, and to raise them to a proper self-respect, and to the beauty of a life of temperance. Consequently, they and

* 'The Washingtonian Home and its Sixteen Years of Work.' Address, etc., by Otis Clapp. 1874.

† Recently the corporation has been enabled to erect a commodious building in Boston, at an expense of $100,000. Thus the total expenditure for this corporation, since its commencement, has been $257,000, of which only $71,000 have been given by the State in its annual grants.

‡ 'Fourth Annual Report of the Managers of the New York Inebriate Asylum, Albany.' 1874. p. 5.

§ The following list comprises, it is believed, all the permanently organised Inebriate Asylums in this country. Some smaller ones may exist, of which I have no information. 1. At Binghamton (New York State Asylum). 2. New York City Asylum (under Board of Charities of the city). 3. King's County Home for Inebriates, Brooklyn, N.Y. 4. Maryland Asylum, at Baltimore, Md. 5. The Sanitarium for the Treatment of Inebriates, at Media, Pa. 6. Washingtonian Home, Chicago, Ill. 7. Washingtonian Home, Boston. 8. Greenwood Asylum, under Dr. Albert Day (recently nearly destroyed by fire), at Stoneham, Mass.

their families are often left to regain an honourable status in society as best they may. By putting them into the hospitals I advocate, we shall not only support them, as we do now, but we shall restore a large percentage of them to the rank of honourable citizenship, and they and their families will become a part of the working force of the State, instead of being an incubus upon it, as they now are. And we shall gain these desirable ends without a much greater expenditure of funds than we now make for a comparatively futile purpose.

1. *Classification of Drunkards in Asylums.*

Drunkards may be divided into different classes, needing different treatment. Doubtless each individual has his own peculiar character and tendencies. Hence, each drunkard should be managed so as to meet his peculiarities, in the same manner that physicians, while guided by general principles of action, have to adapt their treatment to each special case among their patients.

Among these classes of drunkards I will name the following :

Some have hereditary tendencies to the vice, and they are the most difficult of radical cure. The family taint seems at times to fairly overcome all efforts of the individual. Unless a great determination to become temperate be made by the drunkard himself, and the wisest course be pursued by the friends, such a person is doomed to spend a worse than useless life, disgraceful to himself and a source of endless sorrow to his friends. Others, again, seem to have periodic fits of an insane desire for drink. They will be perfectly sober and excellent men and women for several months, when suddenly, either from great sorrow, or some more trivial cause, or from helpless subjection to instinct, the liquor is seized upon to 'drown care.' The poor wretch then makes himself a brute for several days or weeks, until generally the stomach loathes all food; and even the liquor, previously gloated upon, becomes wholly distasteful. Not infrequently the attack terminates in that state called in common language 'the horrors.' Nothing can be more pitiable than the condition of a human being when reduced to this dire extremity. Trembling in every muscle, his wild face is the fair index of the mind. He is no longer the drivelling idiot, but a 'horror'-struck maniac, urged by terrible dreams in which, perhaps, his best friends seem acting the part of fiends, while their gentlest movements to overcome his terror appear to him brutal attacks upon his liberty or life. He trembles, and flies affrighted from imaginary demons who are pursuing him. He is in hell, even when surrounded by loving attendants, who vainly endeavour, by caresses, to soothe him in his fright. I wish I could, like the Spartans of old, introduce every young drinker into the presence of a poor wretch when in the height of a paroxysm of delirium tremens; and, if the youth did not become a temperance devotee from that moment he would not be moved by any argument. If he could be persuaded to act as an attendant through these few days of horror, and vainly endeavour to restrain the wild delirium; if he could see the fear manifested by the victim, and watch the sudden approach of death, or the slow process of cure with entire prostration of physical and intellectual powers, the lesson would, I am sure, be a good one.

A third class, from want of an early training in a manly temperance, or from evil companionship, fall into habits of intemperance. By temperance, in this climate and country, I mean total abstinence in childhood, and only the occasional use of wine in youth, when need of body requires it, and in subsequent life, the more frequent, but still moderate, use of alcohol when health or strength call for it.

Again, it is essential, in any definition of drunkards, for the purpose of ulterior treatment in asylums, to consider the relative amount of culture and refinement, or the reverse, among the different classes. I know that we are accustomed to consider all men as equals in this country; and yet, save in God's presence, and before human law, where all have equal rights, there never was a more flagrant abuse of terms, or a greater falsehood laid down. Of all persons born into this world, no two are exactly equal, physically, intellectually, morally, or in the surroundings of their birth. These facts have immense influence on all subsequent development, from the cradle to the grave, and they must be considered, in any arrangements to be made, in the treatment of drunkards.

Finally, the intemperate may be divided into two more classes, viz. : those who, being fully aware of their desperate condition, have made up their minds, and are anxious to use any and all means for a radical cure; second, another class who, though aware of their degradation, have not the moral courage to withstand temptation, or who brutally refuse to leave off drinking. Taking either of these categories of drunkards, let us see what is necessary to meet their necesities in an asylum for their cure.

I think arrangements could be made in inebriate asylums, as at all hospitals, for private apartments and public wards. Out-of-door arrangements, such as farm work, and work in mechanic shops, or the more quiet pleasures of intellectual pursuits, are likewise called for.

It seems to me that at least one asylum should be forthwith erected, or adequately endowed, by this State. Eventually, when the ideas connected with such a building become more thoroughly digested by the people, we shall need more, in order to classify the inmates; certainly, so far as to partially, or perhaps wholly, separate those who voluntarily seek the asylum from others who are compelled to go there by law. I think, still further, that it would be advisable to allow those able to pay for larger and more commodious apartments, and fuller attendance, to do so, in the same way as the McLean Asylum provides the 'Appleton Ward.' In this way we could give a more home-like feeling to some persons than can possibly be obtained in a large ward. I should hope, however, that in every asylum there would be an opportunity for all to meet on a common ground of the lecture room, the church, the library, and reading-room. I should wish for this amount of intercourse, because I would have the asylum, as much as possible, like the world at large, save in one particular, viz., there should be such a total abstinence from liquor as would gladden the heart of the warmest friend of prohibition. I would scarcely ever use alcohol in any form, even medicinally, and as a lotion, and never (if possible to avoid it with safety to human life) should it be taken internally, within the walls of an inebriate asylum.

2. *Sites for the Asylum.*

They should be in the interior of the State, in a fertile spot, where farming would be possible and easy. They should be removed from the noises and

temptations of the city, but easy of access by rail. The grounds should be extensive, and well laid out in roads, bridle, and foot paths. They should have woods near or upon them. The sites should be, if possible, among the most beautiful and healthful in the State; they should command extensive views, so that the first sight that would greet the eyes of the inmates, with every morning light, should be such as to excite pleasant and grateful thoughts. The houses should be commodious, of medium size, and not expensively or luxuriously built. They should be airy, and bathed in sunlight all day long; ample space should be afforded by them for walking and exercise in all weathers, by means of piazzas, or covered corridors, carriages, etc. These sites should be recommended, as by law now provided that all sites for public institutions should be, by the State Board of Health, with especial reference to the various sanitary conditions best fitted for mind and body. In a word, I would have every arrangement in and outside of the houses so made as to produce cheerfulness and brightness. A tranquillising, but not sad, influence should permeate and surround the whole.

3. *Employments of the Inmates.*

A large farm should be connected with each institution. This should be under the direction of an experienced farmer, who should ask the services of volunteers, or should require of non-paying inmates, whether voluntary ones or those put there by law, a certain number of hours of work each day. This work would be beneficial to the worker, and while it would produce a certain amount of the food for the establishment, it would also aid in the proper discipline of the inmates. Immediately around the house should be planted flower-beds, similar to those seen everywhere in England, which, kept in order by the inmates, would contribute much to the pleasure and healthful activity, if not actual profit, connected with the house.

4. *Work-Shops.*

Work-shops, in which carpentering, joining, painting of all kinds, and turning in iron and wood, could be carried on, should be in constant operation. They should be the general repair-shops for the institution. Of course, skilled workmen should superintend; but the object being to afford interesting work to inmates, all should be urged to avail themselves of the privilege of more or less active work therein afforded. Those who by law may be confined should be required to labour, and might be taught some useful trade, which would help support them on leaving the asylum. Amongst others, I should hope the printer's trade would not be neglected. A journal, published by the patients, would be one of the most effective means of pleasure and improvement for all.

5. *Amusements.*

There should be amusements of every kind; billiard rooms; bowling alleys should be open; base ball, cricket, foot-ball, and croquet should be encouraged by the superintendent. The superintendent and his wife should likewise be persons capable of preparing evening entertainments, charades, whist-parties, readings, recitations, lectures and concerts. Occasional private conferences of the patients might be held, at which personal experiences might be told, in full confidence of the entire sympathy of all present; to these no outsider should ordinarily be admitted. Many a word of encouragement and of abounding hope might be given at these friendly meetings by those who have been through the 'slough of despond,' and may have overcome all difficulties. Some poor soul, still struggling with the trials attendant on a weak nature, and while staggering almost in despair of ever reaching any sure foot-hold, from which to begin anew the work of life, would gain at such meetings the requisite courage and strength. If possible, I would have a band of music from among the residents, led by an experienced music-teacher. An adult school should be open daily for the instruction of those ignorant of the common rudiments of learning. Assistants in this school, as teachers, I should expect would be sometimes found among the patients. A wise superintendent would gently but earnestly urge this duty of teaching upon those of the inmates who have better cultivated minds, placing it upon the high ground of mutual benefit to the teacher and taught; for surely no employment tends more to develop the intellect and all manly qualities, than self-forgetful instruction given to those less wise than ourselves. Agassiz considered the name of teacher to be the highest title he could assume.

6. *Superintendent.*

This man should be of a large and high-toned nature. He must be able to look upon all the inmates, however degraded they may be at entrance, as fellow-mortals, born under the same laws as those which brought himself into existence, and therefore his own self-respect should lead him to treat those committed to his charge with respect as well as with authority. He should do all his work under a solemn sense of responsibility to God and to man; he should be no bigot of a sect. He should not try to proselyte to certain dogmas of belief, but to gently lead all to temperance. His object should be to induce all under him to act up to that inner light that dwelleth in every human being, and which tells him that an honest, true and temperate life is the only one worth pursuing. He should have a finely cultivated intellect, and he should be in perfect health of body, otherwise his important duties would be likely to suffer.

Dyspepsia, or debility of mind or body, are always antagonistic to authority and to a true estimate of life in others. His presence should be a benediction as well as a power.

Such a man would have equal laws, but no tyranny. His word, having been once declared, under the best light he can get, would govern all with justice and mercy. No common man could take the place. He should be selected by trustees appointed by the governor and council, and be removable at the pleasure of the trustees, under whom he would act. We have very few in the community capable of taking the place; there are doubtless many persons who would seek the place for the salary, and for the gratification of the petty, though perfect, authority the office would confer.

If possible, a man who has had experience should be first selected, and his deputy, chosen or nominated by himself, should be gradually initiated into all proper methods of conducting the establishment. The whole should be under the general direction of some non-political body of trustees, appointed by the executive of the State. Believing that the treatment of intemperance is one of the greatest subjects

this board can consider, and looking to the far future, rather than to the present, I think that the duty of superintending these establishments, and of nominating the proper persons to be resident superintendents, might, with propriety, be vested in the State Board of Health. I hold this opinion upon these, among other reasons, that might be adduced for this suggestion, viz.: (1) That in the original Act establishing this board, the Legislature ordered the board from time to time to report upon the uses of alcoholic liquors by the community, and for the prevention of intemperance; and (2) because by the same Act the board was directed to advise with the Government on the selection of sites for public institutions; and (3) because by its constitution the board will generally be removed from party politics and partisanship.

7. *Attendants.*

These should all be selected with especial reference to the moral rather than the physical objects of the place, and no one should ever be appointed to fill any place who was not fully alive to the high objects proposed, and hopeful of good from the general work of the institution.

As great care should be used in the selection of these persons as is now taken in the choice of attendants in hospitals for the insane. The superintendent should nominate them to the trustees, and should be held strictly responsible for their good behaviour.

8. *Religious Instruction and Worship in the Place.*

I would have services at certain periods, conducted by clergymen of the various denominations, or by laymen. No dogmas should be preached, but the sole object should be to lead the inmates to a proper self-respect, by raising in each a lively sense of his own responsibility to God and to mankind for the proper care of his own body, by living a temperate life; even this latter point should be rather indirectly than directly advocated. For I would not willingly offend by a religious act the self-esteem of a patient in the asylum. No one should be obliged to attend these services, and no one, for non-attendance, should suffer in the estimation of any one or have different treatment in consequence of such absence.

PENAL ASYLUMS.

In all I have thus far suggested, I have supposed an institution in which the inmates have rather a voluntary than a forced residence. It may be asked, how I would manage those incorrigible, brutal drunkards, who go to the place from no will of their own, but simply when forced to do so by the arm of the law. It is evident that, at first, it will be necessary to use more restraint; but even with these poor wretches I hope that an able and skilful superintendent would soon be able to relax all penal arrangements. Especially could this be done if the court, when sending the victim to the asylum, should let him distinctly understand that if he attempt to escape, without permission, or behave in a manner unbecoming the institution, he will be summarily sent to a house of correction, or otherwise more severely treated.

ASYLUM ACCOMMODATIONS FOR WOMEN.

In my preceding remarks I have, while considering chiefly asylums for men, made many suggestions that are equally applicable to institutions, or parts of institutions, which would be devoted to the treatment of females. Of course the superintendent of a female institution or department of a general asylum should be a woman. Some modifications of employments would likewise be necessary; but the general principles of treatment of the male and female drunkard would be identical.

REPORTS.

Annual reports to the legislature should be made by the trustees early in the legislative year, with statements of finances, and of all other points of interest naturally connected with such an institution.

CONCLUSION.

I have thus given my sincere convictions of what the State ought to do, in one direction at least, toward stemming this frightful evil of intemperance, which, although perhaps less diffused than formerly, and certainly not permitted by society as it was formerly, is nevertheless an evil of the greatest magnitude in Massachusetts. I sincerely hope that the board will unite with me in advising the legislature to enter upon this plan of reformation. The idea, I trust, will also commend itself to all citizens. No one, even if he be a temperate or intemperate user of liquor or a strictly total abstainer, can object to this, which has been proved to be a feasible plan for curing the real drunkard.

Finally, I would suggest for your consideration the following resolution:—

That this Board earnestly and unanimously recommend to the legislature, as a sanitary measure of the highest importance, the establishment or endowment of one or more inebriate asylums or hospitals.

THE ORNAMENTAL(?) FOUNTAINS AT CHARING CROSS.

BY JOSEPH NEWTON, C.E.

THE demolition of Northumberland House, and the construction of a new thoroughfare athwart its site are works which naturally followed the formation of the Thames Embankment. They are likely to be of great value to the public, and will, if properly completed, reflect much credit on the Metropolitan Board of Works. If, however, the opening up of the new roadway is to be attended with all the advantages of which it is susceptible, the immediate surroundings of the locality must be made consonant with the projected improvements. This they certainly are not at present—in our estimation, at least.

When the street which is to connect the Thames with Charing Cross shall be completed, the traffic through it will, no doubt, be very great. That and the Embankment will form relief-valves to the Strand and especially Fleet Street, and will lessen the vehicular pressure under which they now suffer to a material extent. So far the change must be beneficial. Mere utilitarianism, however, is not the sole desideratum in making improvements of this kind. Sanitation and ornamentation must be their handmaids, if not their consorts, or else the sum of their value will be reduced to a minimum.

By way of an example of a good site spoilt for lack of due observance of these principles let us

refer to Trafalgar Square. There are two good reasons for doing so, namely, its proximity to the new thoroughfare, and the fact that the latter will presently make its defects yet more palpable to the public nose and the public eye. Within the memory of men of the current generation the Nelson Monument and the fountains at its base were designed and constructed. Of the former we have nothing to say just now, but of the latter it is necessary to speak out earnestly and distinctly. The fountains of Trafalgar Square, as they are to be seen and smelt at present, are a nuisance to everybody. It may be that those who planned and formed them imagined they were adding a charming feature to what Sir Robert Peel called 'the finest site in Europe.' Few persons are now likely to share in that hallucination. The fountains are really neither ornamental nor useful.

In the summer season they look tolerably well—in the distance—for the sight of plashing water is generally agreeable, and its sound, too, for that matter. The 'roar' of the London streets effectually neutralises the latter charm, whilst the former is destroyed by the vile odour of the water emitted. It is said, indeed, that the water does double duty. If so this may account for its lack-lustre appearance and its vile effluvium. Certainly the baths of St. Martin are sufficiently near to justify a suspicion as to the dual part played by the murky and unsavoury fluid.

During the winter season the aspect of the fountains and basins is simply chilling and repulsive. The joints of the basins are usually leaky, and add their oozing quota to the general sliminess of the surrounding pavements. Thus in all ways and at all seasons the Charing Cross *soi-disant* ornamental water-works are an abomination. The residents in their neighbourhood may well be alarmed in very hot weather by the intrusion into their dwellings of the vapours which are very sensibly apparent to casual wayfarers.

As it is always well in indicating an evil to suggest a remedy for it, let us do so in this instance. The original ugliness of the whole design can only be overcome by ridding the square of the basins and fountains altogether, but if they are to remain, the judicious expenditure of perhaps a hundred pounds or so would certainly effect a great improvement.

There is a radical defect in the construction of the basins which may be easily overcome. They are of equal depth from centre to circumference instead of deepening gradually from the centre.

Owing to this original error of construction, the basins receive the water falling from the jets, and retain it until they are full. Then the overflow commences, and as only the surplus surface water passes off, the bulk of the already impure fluid remains in the basins to stagnate, and finally to stink! Thus the disease-promoting process goes on week after week and month after month, to the annoyance of passengers and the detriment of the denizens of the surrounding districts. Now what can be simpler than to obviate this perpetual nuisance? Why not shut off the water for a few days, then drain the basins dry, and afterwards shoot a few cartloads of the rubbish from Northumberland House into them? The brickbats, properly disposed and faced with Portland cement might be so arranged as to cause the bottoms of the basins to shelve down from the centre to the circumference. A depth of two inches would be sufficient at the radial points where the water from the jets impinges, whilst immediately inside the basin rims the depth might remain as at present. By means of such an arrangement as this the falling water, instead of drifting away over the festering mass below would have its own gravitating effect, and thus raise and displace constantly the water which had previously fallen. In such case a self-purifying operation would be constantly going on, and however the fountains might remain an offence to the eye, they would certainly cease to be repulsive to the nose.

As has been said, the surroundings of the new street in course of formation ought to be considered simultaneously with its construction, and certainly the fountains in Trafalgar Square demand the attention of the band of sanitary, social, and architectural reformers whose head-quarters are in Spring Gardens hard by, and whose work is to remodel London, and leave it in all ways better than they found it.

THE
SANITARY RECORD.
SATURDAY, AUGUST 28, 1875.

MENTAL OVERWORK.

THE subject of mental overwork is one which is now attracting more and more attention, especially since the publication of some articles on the subject in our columns last year. The dire consequences of the pace at which we now live are so palpable that the attention even of the most thoughtless is being more or less attracted to the matter. The more thoughtful of our writers, not only medical but lay, are telling us in impressive language, and demonstrating by irrefutable facts, the untoward results of the present eager race for wealth. It is not indeed that strenuous and persistent exertions are being made in order to make a position in the world, an almost unavoidable necessity; but much harm is being done by sustained efforts to accumulate wealth, after a sufficiency has actually been acquired. It is the present thirst after riches that is chiefly to be blamed for the widespread overwork which now obtains. Efforts are constantly being made and maintained which tax to the utmost the system's powers of endurance.

With the question of whether happiness is to be found in material wealth only, or whether it is not rather to be sought in other directions, we are not concerned. The question under consideration is that of the effects upon the organism, and especially upon the nervous system, of the present overwork and of our high-pressure existence. We are told that affections of the heart are more numerous now than they were: we know only too well the enormous additions being made to our asylums all over the country; we are assured that other nervous affections are upon the increase; and we all are but too familiar with the increasing irritability and the worn and harassed look

of business men. Such consequences are indeed sufficient to attract attention, and to incite the thoughtful to inquire what is to be the end of all this. In many cases the final breakdown is brought about by some sudden demand or shock, which could readily have been borne by an untaxed system; in other cases there is a gradual and steady oncome of exhaustion. But for one that breaks down utterly there are dozens who just escape by a hair's breadth. By well-timed rest, or by an enforced holiday, many contrive to evade the most marked consequences of their over-exertion; but nevertheless the strain is felt in lessened capacity to labour, in greater susceptibility to worry—a more trying matter than work by far—and in the necessity for a renewed application and further strain on impaired powers. The overworked man is ever an over-anxious, or what is termed a nervous man. Trifles that once could be put aside or estimated at their real value become sources of decided irritation. The annoyances of life, either connected with business or domestic, become more vivid and less tolerable: as surely as the sore tongue findeth grit, so the overworked man becomes hypersensitive to the irritations inseparable from existence.

Consequently we find that in the patients received into Bethlem Hospital a large proportion are due to overwork; though frequently the immediately exciting cause is some sudden shock or trouble which, however, would not have had this effect if the system had not been overstrung at the time. Just as we find that in cords, in cables, and in wires, a slight blow is sufficient to cause rupture when the tension is high, but which would have produced little effect in a less highly strained condition; so in the human system we find that slight exciting causes are sufficient to produce serious effects when they act upon overstrained organisms. It is not the direct consequences of overstrain which alone are to be dreaded, it is the liability to snap from slight causes so conferred that gives cause for apprehension. In women it is found that slight overwork, when combined with anxiety, leads to disturbance in the intellectual processes. With men it is found that anxiety and overwork are especially productive of insanity when combined with monotonous labour; if the work be diversified its effects are not nearly so disastrous. We are assured by our best authorities on insanity that that terrible disease, the general paralysis of the insane, a disease unknown till this century, is the direct outcome of modern life. In this dreadful disease, to which the French attach the hopeless prefix 'progressive,' there is usually no family tendency to insanity; and its victims are commonly the strongest, the healthiest, and the most energetic. It is, as it were, a grim caricature of our present aims and ambitions. In other persons we find, again, a premature decay, and the enfeeblement of the mental powers wrought by time is anticipated by over-exertion. It does not follow that the amount of mental labour which can be easily borne by one is not too much for another; it is really a question of comparative powers. What is but a light load for one nervous system is an intolerable burden to another, which breaks down under the demand. In estimating overwork we must calculate the powers of the individual as well as the actual weight of labour.

If we point out the consequences of overwork, and show how disastrous they are, we must expect to have the question put, 'How is overwork to be distinguished in its early stages?' This is a fair and just interrogatory, and one which demands an answer. Broadly it may be said that overwork exists when the sense of energy all once possess is distinctly impaired; when it is found an effort to get through what was once a cheerful task; when what was once found comparatively easy is beginning to be felt a trial, and above all, when errors or omissions, the direct outcomes of a flagging and wearied brain, commence to manifest themselves. To spur on an exhausted brain, and by application and longer hours of toil to compel the overtaxed nervous system to complete its round of duty, is one of the most disastrous and erroneous measures that can be adopted. Whenever work, itself unaltered, looks larger than of yore, and is felt to be more trying, then the system is commencing to feel the effects of overwork, which, however, may actually have existed for some time unnoticed. This is especially true of the monotonous labour which is undergone by the clerks and subordinate officials of our commercial houses; if they are free from the anxieties which affect the principals, they are the more subject to the wearing action of monotonous labour. The institution of bank holidays is a step in the right direction, and ere long the absolute necessity for a more decided increase in the number of national holidays will be palpable enough. What man can safely do is not to be measured by his desires, but by his powers; and we are all rapidly becoming convinced that incessant toil is not only undesirable, but that it is uneconomical. The one day's rest in seven is not now sufficient for our needs.

Then again, as regards sleep. It is obvious that with increased demands upon the system—either longer hours of work or more intense labour during working hours—there must also exist longer hours of rest, if the system has not to be ultimately worn out. Old fashioned notions and saws about the number of hours of rest must be laid aside as antiquated, and the amount of rest, and, if possible, of sleep, must be regulated by the sensations, and not by the hands of the watch. At least eight hours of sleep should be secured every day by all who toil hard with their brains, and even an extra hour after dinner is not only permissible, but is often most salutary. If the hours of sleep, and especially those before midnight, are systematically encroached upon by amusements, impaired powers of labour are the con-

sequence; and if the duties are arduous, ultimate failure is the almost necessary result. Sound refreshing sleep is the great restorer, and if the wearied worker, when feeling exhausted, would sleep at each and every opportunity until the sense of energy is once more recovered, we should see less of the effects of brain taxation than we do at present. If the work undergone cannot be diminished, a greater portion of time must be spent in brain relaxation, whose most perfect form is sleep.

THE TREATMENT OF DIPSOMANIACS.

WE have reproduced this week a valuable paper by Dr. Bowditch, on the treatment of drunkards and dipsomaniacs. The question is one which deserves very serious considerations, for the evils of drinking are extending rapidly. The excise duties alone for the year ending March, 1875, amounted to 31,917,849*l.* being an increase of 600,000*l.* over the previous financial year, and this increase cannot be taken to represent socially a healthy state of things.

The need for establishing a home for habitual drunkards and dipsomaniacs has long been recognised by many members of the profession, notably by the late Dr. Dalrymple of Norwich, and Mr. George Holthouse, of London, who has long been working energetically to establish some system of supervision over this unhappy class of patients with a view to restore them eventually to society in their right mind. Sir Thomas Watson, in his remarks to Mr. Cross on the occasion of a deputation, having for its object the treatment of habitual drunkards, gave some cogent reasons for the establishment of such homes. He said, 'Among habitual drunkards, there are many in whom what was begun as a vice passes into a frightful bodily and mental disease. The frequent use of intoxicating liquors in excess, and especially of alcoholic drinks, leads at length to an accumulation of the specific poison of alcohol within the system, so that the bodily tissues, and chiefly the nervous tissues, which include the brain, become so impregnated, so charged with the poison, or so affected, as to produce a degree of craving which the unhappy dipsomaniac (for so he is rightly called) is utterly unable to resist or control. So imperative is this morbid craving, that in some instances, by his own confession, he could not refrain from swallowing the customary stimulus even if he were certain that death would be the instant result.'

We recently heard of a case in which a dipsomaniac actually drank the spirits in which *post mortem* specimens were preserved.

'Now, of such persons, it is found that, if they can be strictly debarred from all access to alcoholic drinks, they will surely, though slowly, recover from this form of mania; that the incorporated poison will be gradually dislodged and eliminated from the system by the silent and sole efficacy of that beneficent force which medical men acknowledge so thankfully, the *vis medicatrix naturæ*; and the wretched man or woman will become once more able, and in no small percentage of cases willing, and even anxious, to abandon the vice which had been the first step towards the induction of the maniacal disease.'

There are doubtless many of this unhappy class suffering from an hereditary craving who are not so strictly responsible for the vice, as those who have voluntarily given way to the temptation of drink until it has become second nature. The first probably are the descendants of the previous hard drinking race, the three-bottle men. Of this class it has been said truly, 'The fathers have eaten sour grapes, and the children's teeth are set on edge.' The second class clearly do not deserve so much consideration as the first, inasmuch as their fall is more the result of their own act.

There is no doubt but that we have more drinking now though perhaps less drunkenness than existed formerly amongst the middle, lower, and especially commercial classes, where the 'liquor up' has come in too many cases to be regarded as a *sine qua non*. Probably, too, the high-pressure rate at which we live, the keen competition between all classes of the community, and the mental strain which this induces, has been instrumental in bringing this unpleasant state of things about. One other reason may be in the pernicious nature of the adulterated drinks which are sold.

In either case, however, it is clear that we have a large class of men who require to be protected against themselves, not only for the benefit of the present, but for future generations, and it is incumbent on the State to grapple with the evil boldly and effectively. If this were done all classes of the community would be benefitted, and the numbers of paupers, lunatics, and prisoners would be rapidly reduced.

Notes of the Week.

DR. D. TOLER MAUNSELL.

WE regret to announce the death of Dr. Daniel Toler Maunsell, of Dublin, the able and energetic Honorary Secretary of the Irish Poor Law Medical Officers Association. Dr. Maunsell wrote many valuable pamphlets and articles on the medico-political and social aspects of pauperism and disease. He possessed great ability in the compiling and arranging of vital and social statistics. Dr. Maunsell will be a great loss to the cause of sanitary reform.

A LIVERPOOL SUBURB.

A 'SCOTCHMAN' writes that our correspondents 'Huytonian' and a 'Resident in Huyton' have neither of them given the real facts in reference to the object of

uniting Roby with Huyton in the formation of one urban district.

The fact is that Huyton suffers from the reputation of having very inferior drainage, while Roby is free from such a disadvantage, and has no occasion whatever for any immediate pecuniary outlay, such as is absolutely necessary in the case of Huyton. The inhabitants of Roby are shy of annexation, because they are well aware that a portion of their money would be spent in improvements at Huyton; consequently they prefer retaining their present separate and isolated position.

SHALLOW INTERMENTS.

A CORRESPONDENT at Newcastle writes to direct attention to the objectionable custom which prevails in that district of burying near the surface of the earth. He says:—'A short time since I attended the funeral of a relative, who was interred in one of the Jesmond cemetries, and was astonished to observe the extreme shallowness of the grave. There could not have been more than three feet from the coffin lid to the surface of the ground. This seemed to me so unusual that I ventured to ask one of the attendants if any more bodies were deposited underneath in the same grave. He assured me not, at the same time informing me that it was not customary to dig any deeper unless specially ordered, and at an extra expense. Surely it is unnecessary for me to observe that such a practice must be detrimental to the public health, and nauseous reflections must arise in the minds of those who live adjacent to the cemetery, for a crust of earth only three feet thick cannot possibly prevent the exhalations of corrupting humanity from tainting the surrounding atmosphere. I think it is highly desirable to remedy this at once, or the cremationists will have a strong case in their favour.'

SEWERING AT HERTFORD.

In reference to a paragraph under the above heading, which appeared in our issue of May 15, the secretary of the Phosphate Sewage Company asks us to insert the following extracts from reports of the Ware Local Board of Health. We have great pleasure in complying with the secretary's request, as the report is borne out by another from Dr. Dupré, who has analysed two samples of effluent, and his certificate stated that they were remarkably good, that fish lived in them three days without injury, and that the quality of the water was above the standard laid down by the Rivers Pollution Commissioners. Mr. Prange, managing director to the manure company now in possession of the Board's works, states that the process was a precipitating one, and was the best known means of dealing with the sewage.

This is the extract forwarded by the secretary.

'Board of Health, Ware, June 30. Present: Mr. Chuck, chairman; Messrs. Brandram, Evans, and Wickham. Hertford Sewage: The Surveyor reported thus, "I have to report a sample of the stuff from the open cut of the Hertford sewage works before discharging into the Manifold-ditch was taken by Mr. W. J. Cadett, an officer of the Lee Conservancy Board, on the 17th inst., at 12.30, for an analysis of the same."'

'Ware, Hertford, Sewage Effluent. In consequence of repeated complaints made by the surveyor of the Ware Board of Health, as to the state of Hertford sewage effluent, the Lee Conservancy Board have recently ordered a sample of the water to be taken and analysed. This was accordingly taken at the east end of the brick channel where the jurisdiction of the Ware Board of Health, commences. Dr. Keates' report to the Lee Conservancy Board states that the water, when running, was tolerably bright, colourless, and without any decided odour. It has not undergone any change up to the present time. It appears to be a sample of ordinary pond water, or of the ditches running through the meadows. I can find nothing in the water which would render it unfit to pass into a river. (Signed) T. W. Keates, consulting chemist to the Board.'

COCK CROWING.

AN action has recently been decided at the Brompton County Court which, though unimportant in itself, still has an important bearing on the question of the right of keeping fowls to the annoyance of the neighbours. The plaintiff sought to restrain his neighbour from keeping fowls whose crowing at unseasonable hours disturbed his wife, and retarded her recovery from illness. It was stated for the defence that the defendant was strictly within his legal rights in keeping fowls, and that it was beyond his power to prevent the cock from crowing. The judge said the matter before him was not a question of law but of fact, and a person might strain his legal rights to such an extreme as to make them illegal. So soon as the exercise of a man's rights interfered with those of his neighbour he must make concessions and waive them. He suggested to the defendant the propriety of his undertaking to abate the nuisance. Ultimately the defendant consented to a nominal verdict, and gave an undertaking to discontinue the keeping of fowls.

We are glad that the judge took a fair view of the matter. The amount of annoyance and absolute injury to invalids from fowls, dogs, and other animals is incalculable, and it seems to be a generally received idea that any person has an absolute right to annoy his neighbours in this manner with impunity.

BOARDING OUT OF CHILDREN.

THE Scotch Board of Supervision having obtained returns of all the pauper children boarded out in Scotland, their secretary, Mr. Skelton, drew up a report on the statements returned, from which he draws the following conclusions.

1. That the system of boarding out pauper children, which has been in operation for more than a quarter of a century, has been attended with most beneficial results to the children. 2. That, with rare and doubtful exceptions, the introduction of the practice has not been productive of any evil effects in the districts where the children are boarded. 3. That the success of the system depends upon the care and judgment with which the selection of guardians is made; upon the thoroughness of the inspection and supervision; upon the limitation of the number of children boarded out in each dwelling, and also of the number of children boarded out in each parish. The system has not succeeded in those cases where the children are boarded with persons in receipt of parochial relief or with aged and infirm relatives; where inspection and supervision are not vigilant and habitual; where an excessive number of children are boarded with one guardian; where an excessive number of children are boarded in one parish. It appears, says Mr. Skelton, that the only real and permanent check against abuse is to place the children under the official inspection and supervision of the inspector of the parish in which they are boarded. Many of the smaller parochial boards have already adopted this course; but the large parishes have provided a special machinery for the purpose; and in such circumstances even the names and addresses of the children are often unknown to the inspector within whose district they reside. The machinery provided is, I have no doubt, most efficient of its kind, and ought not to be dispensed with; but I am strongly of opinion that an official relation should in all cases be established between the inspector of the parish of residence and the boarded-out children in his parish; and that for the due discharge of the duties incidental to the office he should be remunerated by the parochial board of the parish of settlement. Such an arrangement would be in many ways of the utmost advantage. Mr. Skelton makes a variety of suggestions for the guidance of inspectors, and concludes by repeating that the returns are in general extremely satisfactory, and that the facts which they disclose afford ample evidence that the parochial boards of Scotland have discharged their obligations to the children, to whom they stand *in loco parentis*, with kindness, judgment, and success.

SCARLET FEVER AT HURDSFIELD.

A SERIOUS outbreak of scarlet fever has occurred at Hurdsfield, in Macclesfield, where out of seventeen cases which had arisen, sixteen were traced to one school, and the seventeenth case was that of a child whose mother had been attending to some of the other children. An application which had been made to the vicar to close the school for a week had been refused by him. This certainly seems on the face of it a rather strange proceeding on the part of the vicar. The sanitary authority, however, are exerting themselves thoroughly in issuing a plentiful supply of disinfectants, and have applied for permission to exert their powers to close the school compulsorily. The sanitary authority were at all events forewarned though perhaps not forearmed against this epidemic, as Dr. George Bland, medical officer of health, has frequently directed attention to the high death-rate of that town.

INFANT MORTALITY AT LEICESTER.

AN abnormally high rate of mortality amongst children under one year of age has for some time prevailed at Leicester, so high, indeed, that in the week ending August 5 out of eighty deaths forty-four were of infants.

Prompted by a sense of public duty, as well as the stimulant of public opinion, the sanitary committee have undertaken to institute a searching investigation to discover the cause of this high death-rate of children. Dr. Edgar Buck and Mr. G. C. Franklin, M.R.C.S., have been deputed to co-operate with Dr. Crane, the medical officer of health, in this matter. Their honorarium (ten guineas) for this work can scarcely be called princely in amount considering the duties they have to perform. These are, to visit every house in which the death of a child under five years of age, from diarrhœa, has occurred since July 1; and to examine the sanitary condition of the premises, including the water-supply, the closet provision, the condition of drainage; to ascertain particulars of illness, whether deceased was under regular medical or what advice; the diet of the child, with especial reference to milk other than that of the breast; the usual state of the health of the parents and their occupation; whether the child was under the personal care of the mother at the time of the attack; and generally to inquire into all facts which, in their judgment, will tend to throw any light upon the causes of the excessive infantile mortality of Leicester. The inquiries are to extend to all localities of the town where infantile diarrhœa is now prevailing, although no death has been reported. To report thereon to the sanitary committee and make such practical suggestions as may occur to them with as little delay as may be compatible with a thorough investigation of the subject. The medical report cannot fail to elicit valuable information.

THE PROPOSED NEW PARK FOR NORTH-WEST LONDON—FAILURE OF THE SCHEME.

NORTH-WEST London is, after all, it appears, not to have its proposed new park. So much we learn from a letter of Mr. Edward Bond to the *Times*. Mr. Bond it was, it may be remembered, who first published the details of the plan—to which we directed attention in the SANITARY RECORD, of July 24, for the formation of a new park out of a portion of the Conduit Fields, which are situated in the neighbourhood of the Finchley Road station of the North London and Midland Railways, and the Swiss Cottage station of the Metropolitan and St. John's Wood railway. The owners of the land, Sir John Maryon Wilson, and his son, Mr. Spencer Wilson, had offered to sell a portion of the ground in question, at what was considered the very reasonable price of 1,000*l.* an acre. It was therefore proposed by the promoters of the new park that the offer of this land should be accepted, and it was hoped that enough money might be raised to purchase, if possible, sixty acres of the Conduit Fields, and not less than forty acres. The proposal was well taken up. Several private individuals together promised sums amounting to two or three thousand pounds, and as the result of an appeal to the public it appears that the sum of 9,000*l.* in all was promised. Now, however, Mr. Bond states that 'the plan has been brought to an abrupt termination,' just as the chance of ultimate success seemed greatest. He says, 'About 9,000*l.* had been promised, and fresh promises were coming in every day. Many persons of influence had undertaken to support the plan, and from many quarters which there had not been time to approach powerful assistance was confidently expected, when the owners, having suddenly removed an obstacle which stood in the way of the immediate development of their estate, gave notice that their negotiations with us must be considered at an end, unless within five days we could definitely guarantee 50,000*l.* The 'owners' were probably pretty confident that this large sum could not be raised in the time given; and, if this view be correct, it must be assumed that they were unwilling to sell at all. We are bound to say that we think the public will consider that the conduct of Sir John Maryon Wilson and his son over this matter is not public spirited, and that the credit which was given to them for generosity was not deserved. For ourselves, we must confess that we had a suspicion—which we scarcely took pains to conceal at the time—that other motives than those which regarded the public good had called forth the apparently generous offer of the owners of the Conduit Fields. However, we deeply regret the result: and the circumstance should serve to direct attention to the impolicy of allowing the retention of open spaces in the neighbourhood of densely populated districts to depend entirely upon the will or the whim of private individuals.

THE SMALL-POX EPIDEMIC AT HASLINGDEN.

AN epidemic of small-pox, which at one time threatened to become of a serious nature, broke out in Haslingden about a month since. The first case was a young haymaker from the West of Ireland, who had only been in the town about a week and must have contracted the disease before leaving home. The rural sanitary authority having disregarded the frequent warning of their medical officer to provide a hospital for isolating cases of this kind, there was no means at hand of removing the patient from the midst of fourteen inmates of a two-roomed, dirty, ill-ventilated Irish dwelling. However, a meeting of the parochial committee was at once summoned, and it was decided to remove the rest of the family to another house in the same row, and leave the patient with his nurse in the infected house. At the end of the first week this patient died, and as it was feared a wake would be held over the body, the intervention of the priest was sought, and the medical officer directed the house to be watched. As there seemed no intention of holding a wake at midnight the watch went home, and it is believed that after that time several persons held a wake over the body. The corpse was interred next day, the bedding destroyed, and the house fumigated and whitewashed. About twelve days after this, seven other cases broke out in different parts of the town, and it is believed that these were all persons who had either been at the wake or persisted in visiting the infected house in spite of the printed warning of the sanitary authority. As things were beginning to look serious the parochial committee, with the consent of the rural authority, decided to erect an iron hospital as quickly as possible; but as this could not be got ready under three weeks, and as it was thought the disease might have become uncontrollable by that time, the following resolution was passed. 'That the medical officer of health, Dr. Harrison, be invested with all the powers of the committee, and be authorised to carry out whatever he considers necessary or expedient in the present emergency, both as regards the provision of a building for the isolation of cases, and furnishing the same with the necessary articles, etc., for the proper treatment of the patients, and the general safety of the community.'

In accordance with that resolution, an isolated farm-house and cottages adjoining were secured on the 3rd inst., and at the end of three days were ready for the reception of patients. Four patients were sent in on the 6th inst., and one on the 8th, leaving one in the town too ill to be removed, and one, a very mild case, which was convalescent. Three patients have since died in the hospital, and the one left in the town, making five deaths in all; two cases in the hospital are recovering, and there have been no new cases in the town since the 8th inst. The last death in the town was on the 10th.

All the bodies were interred within twelve hours after death, except the first. Disinfectants have been freely used. All infected bedding has been destroyed; every infected house has been fumigated with chlorine gas, and whitewashed. Vaccination and re-vaccination have been advocated by means of posters and handbills. It is to be regretted, however, that the Irish people have an impression that if a person be re-vaccinated, and afterwards take small-pox, he is sure to die. Consequently very few have availed themselves of this protection against the disease.

The Health of Watering Places.

XI. WORTHING.

IT is not easy to decide what area should be taken to represent the watering place known as Worthing. The township and local board district of Worthing, which is its only recognised boundary, consists of a portion of the ancient parish of Broadwater; it is evident, however, from a study of the census report for 1871 that a considerable portion of the natural growth of Worthing has taken place outside the township and local board district. The population of that portion of Broadwater parish, lying outside Worthing township, increased from 661 in 1861 to 1,228 in 1871; and that of Heene parish (including West Worthing) from 164 to 427 in the same period. We prefer, therefore, to take the two parishes of Broadwater and Heene to represent Worthing as a watering place, for the purpose of our proposed examination of its mortality statistics in 1874. The population of these two parishes in 1801 was but 1,119 persons; in 1831 it had increased to 4,729; between 1831 and 1841 it rose to 5,530; in 1851 it was 6,203; in 1861 it was 6,660, and in 1871 the population enumerated was 9,068. The increase in the population of these two parishes taken to represent Worthing, in the last decade, 1861–71, was equal to 36 per cent., whereas in the preceding thirty years, 1831–61, it had not exceeded 41 per cent. Assuming that the high rate of increase of population which prevailed between 1861 and 1871 has since been maintained, the number of inhabitants of these two parishes in the middle of this year may be estimated at 10,339, of which 8,225 may be taken as residing within, 2,114 without, the township and local board district of Worthing. This area appears to represent much more nearly that of the watering place than does either the local board district or the registration sub-district of Worthing. It is true that the township of Worthing is under a different sanitary authority to that of the outlying portion of Broadwater parish, or the parish of Heene; but the whole are included in the combined urban and sanitary district of West Sussex, to which Dr. Chas. Kelly is medical officer of health.

As we shall be dependent, to a great extent, upon the statistics of Worthing registration sub-district for the means of estimating the sanitary condition of the watering-place in recent years, it is necessary to state the nature of its boundaries. The sub-district includes an addition to the parishes of Broadwater and Heene, the five rural parishes of West Tarring, Clapham, Durrington, Goring, and Ferring; these five parishes have an area of more than seven thousand acres, and their population declined from 1,814 in 1861, to 1,798 in 1871. The rate of mortality in Worthing sub-district, which is taken by the Registrar General in his Watering-place Table to represent Worthing, differs but slightly from that in the local board district, or in the larger area of Broadwater and Heene parishes which we prefer to accept. During the year 1874, for instance, the death-rate in the Worthing sub-district was 15·4 per 1,000, after correction for deaths in the workhouse; while in the two parishes above mentioned it was 16·3. The inclusion of this purely rural population of rather less than two thousand lowered the rate for the sub-district by nearly 1 per 1,000; the influence of this rural population upon the death-rate of the sub-district would, probably, vary from year to year, and would more frequently be below than above what it was in 1874.

In the registration sub-district of Worthing the average annual birth-rate during the ten years 1861–70 was 26·3 per 1,000. In the four first years of the current decade it has been successively 26·1, 29·0, 26·5, and 27·2 per 1,000; thus averaging 27·2 per 1,000 in the four years 1871–4, or nearly 1 per 1,000 higher than in the preceding ten years. From this it may be assumed that the high rate of increase of population, which occurred between 1861–71, has since been maintained, and that consequently the estimate of the present population of Worthing, which is based upon this rate, and has been adopted by the Registrar General and in this paper for the calculation of recent rates of mortality, is sufficiently trustworthy for the purpose.

During the ten years 1861–70 the annual rate of mortality from all causes in the sub-district of Worthing averaged, after correction for the deaths in the workhouse, 17·8 per 1,000. In the past four years, 1871–4, the rate has been successively, similarly corrected, 16·5, 18·1, 15·8, and 15·4 per 1,000; the average rate in the four years has been so low as 16·5 per 1,000, and 1·3 lower than that which prevailed in the ten preceding years. In proceeding to examine in greater detail the mortality statistics of Worthing in 1874, we shall confine our attention to the area we have adopted to represent the watering place, namely, the two parishes of Broadwater and Heene. The deaths registered in these two parishes in 1874 were 157, which, after correction for the deaths of paupers in the union workhouse were equal, as before stated, to a death-rate of 16·3 per 1,000, exceeding by 0·9 per 1,000 the rate for the year in the entire sub-district, which also includes the five mentioned rural parishes.

The 163 deaths debited to the parishes of Broadwater and Heene during the year 1874 included seven which were referred to whooping-cough, six to diarrhœa, five to diphtheria, one to enteric fever, and not one either to small-pox, measles, or diphtheria; in all, nineteen deaths resulted from these seven principal zymotic diseases, equal to 11·7 per cent. of the deaths from all causes, and a rate of 1·9 per 1,000 persons estimated to be living. In the registration sub-district of Worthing the average annual death-rate from the principal zymotic diseases was 2·6 per 1,000 during the ten years 1861-70; and in the three years 1871-3 it was successively 1·8, 2·2, and 1·3 per 1,000. Thus, during the four years, 1871-4, this zymotic rate averaged 1·8 per 1,000, and was 0·8 lower than the average rate in the ten preceding years. Among the ten English watering places, the statistics of which have been previously discussed in these columns, the death-rate from these seven zymotic diseases in 1874 ranged from 0·9 and 1·5 in Eastbourne and Ramsgate, to 5·7 and 6·4 in Weymouth and Yarmouth.

It will be useful briefly to notice a few details relating to the nineteen deaths referred to the seven principal zymotic diseases in the parishes of Broadwater and Heene during the year 1874. Whooping cough, which was somewhat prevalent in Worthing in the last quarter of 1871, and the first of 1872, caused no death during 1873; of the seven fatal cases in 1874, five occurred in the first quarter of the year, and one each in the second and third. These seven deaths from whooping-cough included five in Worthing township, one in the part of Broadwater parish outside the township, and one in Heene. Diphtheria was

somewhat fatally prevalent in Worthing in the latter part of 1872 and during 1873; all the five deaths referred to this disease in 1874 occurred in the first quarter of the year, and included three in South Street, Worthing, and two in the small portion of Broadwater parish lying outside Worthing township. With regard to the five deaths from diphtheria in the first quarter of 1874 it is worthy of note that the cause of death was certified as 'ulceration of the throat and fauces,' in two cases, and simply as 'ulcerated throat' in another. Diphtheria was only plainly returned as the cause of death in two of the five cases, although there is little reason to doubt but that the three noted above were really cases of this disease. Whatever may have been the motive for certifying the cause of death in these three cases so indefinitely, the fact is to be regretted. The value of the death-register for sanitary and statistical purposes would be seriously affected if the cause of death in any large proportion of cases was returned so loosely as 'ulcerated throat,' without any attempt to pronounce upon the cause of such ulceration. The only death referred to fever in Worthing during 1874 was one certified as enteric at Westbrook Villas in the first quarter of the year. To puerperal fever (which is not included with the seven principal zymotic diseases) one death was referred in Worthing in the last three months of 1874. The six fatal cases of diarrhœa, of which five occurred in the third or summer quarter of the year, included five of infants or young children, and one of a person aged upwards of sixty years; the five deaths in the third quarter were equal to an annual rate of 2·0 per 1,000 persons estimated to be living. No death was referred to diarrhœa in Eastbourne during the summer quarter of 1874; whereas in the other watering places previously noted the annual death-rate from this disease during those three months ranged from 1·2 and 1·3 in Hastings and Weymouth, to 3·5 and 4·9 in Lowestoft and Margate.

During 1874, within the two parishes taken to represent Worthing, eighteen deaths were referred to diseases of the respiratory organs, and twenty to phthisis; these deaths were equal to a rate of 1·8 per 1,000 from the former, and 2·0 from the latter. The death-rate from diseases of the respiratory organs, 1·8 per 1,000, contrasts favourably with the rates from the same diseases in the other watering places for which we have been able to obtain similar information for 1874; it was equal to 2·4 per 1,000 in both Folkestone and Lowestoft, 2·6 in Eastbourne, 3·1 in Hastings, and 3·6 in Dover. The phthisis rate in 1874 was equal to 1·3 in Lowestoft, 1·4 in Folkestone, 1·8 in both Eastbourne and Dover, and 2·6 in Hastings; as before stated, the phthisis rate in Worthing was 2·0 per 1,000 in 1874, and was somewhat higher than in any of the other watering places except Hastings. In Hastings the death-rate from phthisis is undoubtedly raised by the deaths of visitors from this disease, and there is reason to believe that to some extent this may also be the case at Worthing. The low death-rate in Worthing from diseases of the respiratory organs (including principally bronchitis, pneumonia, pleurisy, and asthma) suggests that the climate is favourable to the treatment and cure of inflammatory diseases of these organs. This subject, however, should be investigated over a longer period of time than one year, in order to arrive at a sound conclusion.

Infant mortality, measured by the proportion of deaths under one year of age, to births registered was equal to 95 per 1,000 in Worthing during 1874, against 126, 148, and 109 in the three preceeding years. Infant mortality in England during 1874, measured in this way, averaged 151 per 1,000, whereas in the ten watering places previously referred to, it ranged from 113 in Ramsgate to 158 in Lowestoft. In the three years 1871–3 the infant death-rate in Worthing did not exceed 128 per 1,000, but the rate of ninety-five in 1874 was exceptionally low. The twenty-seven deaths of infants under one year of age during 1874 in the two parishes taken to represent the watering-place, included nine from zymotic diseases, two from disease of the respiratory organs, two from premature birth, and ten were returned under the more indefinite headings, thrush, convulsions, atrophy, and debility.

The enumerated population of Worthing sub-district in 1871 contained a proportion of 95·1 per 1,000 of persons aged sixty years and upwards; this proportion was unusually high, and considerably above that which prevailed in the other watering-places we have noted. Assuming that the proportion of persons aged upwards of sixty years is the same now as it was in 1871, it may be estimated that the number of persons living at those ages in the middle of 1874 was 953 in Broadwater and Heene parishes, and as sixty-four deaths at those ages were registered in the year, the death-rate was equal to 67·2 per 1,000. This death-rate in Worthing among elderly persons, although 4·8 per 1,000 below the average rate in the whole of England and Wales, was higher than in any of the other ten watering-places, among which it ranged from 56·4 in Weymouth to 67·1 in Eastbourne. Why the death-rate among persons aged upwards of sixty years should be so high in Worthing it is not easy to decide, more especially when it is borne in mind that the death-rates at other ages, especially among infants, are so low. It should also be stated that the death-rate in Worthing among persons aged more than sixty years is really understated, as the deaths of all indoor paupers are registered in Littlehampton sub-district, and ten of the twelve deaths in the East Preston union workhouse in 1874 were of paupers over sixty years of age.

Before closing this examination of the recent mortality statistics of Worthing it will be well briefly to notice the figures relating to the sub-district published in the Registrar General's returns relating to the first two quarters of this year. During the six months ending June last, 118 deaths were registered in the sub-district, against 101 and 92 in the corresponding periods of 1873 and 1874. This excess, as in most other parts of the country, was principally due to the increase of deaths among elderly persons; the proportion of deaths at sixty years and upwards to total deaths, which had been equal to 36 per cent. in the first halves of 1873 and 1874, rose to 42 per cent. in the same period of this year. The annual death-rate was equal to 20·4 per 1,000; only three deaths were, however, reported from the seven principal zymotic diseases, equal to a death-rate of but 0·5 per 1,000, which was considerably lower than in any year since 1871. The three deaths from zymotic diseases included two from fever in the first quarter, and one from scarlet fever in the three months ending June. Of the two fatal cases of fever, one was of a Dorsetshire clergyman in Farncombe Road, on February 6, certified as typhus; and the other was of a child, aged two years, in Chapel Street, described as gastric.

There are few watering places on the English coast in which sanitary matters have received such careful attention as in Worthing, and it is but reasonable to attribute to this, in a great measure, the low and declining rate of mortality which has there prevailed in recent years. The water-supply is of excellent quality, abundant in quantity, and supplied on the constant system. The water is derived from two wells, the bores extending to a depth of about 400 feet in the chalk, and is pumped to the top of a water tower 110 feet high. The drainage system is of the most complete character, and the main sewer has an outfall into the sea at a place called Sea Mill Bridge, about two miles east of the town. We have no information as to the system of ventilation of the sewers and drains that is adopted, and upon the efficiency of ventilation depends in great measure the sanitary value of a drainage system. There is one point, however, in the sanitary organisation of Worthing which calls for the attention of the local board and their medical officer. The town is, or was till recently, unprovided with hospital accommodation for the isolation, and treatment of infectious diseases, and however satisfactory the sanitary condition of a watering place may be, it is impossible to guard against the importation of cases of zymotic disease, which, without the means of isolation may cause an increased death-rate and

damage the reputation of the town. The slight outbreak of diphtheria in Worthing in the early part of 1874, might probably thus have been avoided. With this additional precaution against contingencies, the present satisfactory condition of health in Worthing would be more firmly secured. The protection which is afforded to Worthing by the South-downs from northerly and easterly winds, is probably one of the means which conduce to the comparatively low death-rate in Worthing, especially from inflammatory diseases of the respiratory organs; and the same cause may also assist in causing the satisfactorily low rate of infant mortality in the town. The high death-rate among elderly persons is, however, worth investigation.

It was remarked in the commencement of the present century that in process of time, should the taste of the day continue, it was not improbable that every paltry village on the southern coast which had a convenient beach for bathing, would rise to become a considerable town. Notable examples of villages which started about this time are Worthing, Bognor, and Littlehampton. But they have enjoyed very various degrees of prosperity. Worthing has been the most fortunate. In a short space of time a few miserable fishing huts and smugglers' dens were exchanged for buildings sufficiently extensive to accommodate the first families in the kingdom; and, with some few exceptions, Worthing has gone on increasing steadily, although it is only within the last few years that it has had its last and greatest development. The climate is mild, like that of the warmer parts of Brighton. The range of temperature is unusually small, which accounts for the flourishing growth of its figs. So mild is the climate that some used to bathe in the open sea in winter. Some find it rather relaxing. Worthing is protected by hills to the north, and partially so to the north-east, and is open to the south.

It has excellent sands and bathing arrangements; also a bath establishment on the marine parade; abundance of good houses, good shops, and of good schools; and is altogether a very comfortable and convenient place of residence. It is less expensive than Brighton.

Worthing is fairly provided with the usual amusements of such places, with assembly and reading rooms, and a literary institution. The country behind it is more interesting than that behind Brighton, and more attractive to the pedestrian. With the help of the railway a great many points of interest may be examined in the neighbouring country. There are many churches, such as the large one of Shoreham; the old entrenchments on Cissbury Hill, and Cæsar's Camp, near Finden. Arundel with its castle and grounds, and Petworth, which is further off, are most conveniently visited from Littlehampton.

Littlehampton has been from the first a quiet, respectable, dull little place; it is on a flat slip of land by the sea, has much the same climate as Worthing, and has good sea-bathing; it has little variety to offer, but is suitable enough for families with a good many young children. There is some trout fishing at hand in the river Arun.

Bognor is much the same sort of place as Littlehampton, but differs in having once taken a very decided start, and having been favoured by royalty. In those days it was considered to suit only the higher class of society. Although it is counted the livelier place of the two, there is not much stirring in Bognor. To the list of objects to be seen from Worthing, Littlehampton, and Bognor, must be added the town of Chichester, with its cathedral, its cross, and its very ancient almshouses. Here, as at Littlehampton, as there is no harbour, the sea view is not enlivened by the presence of shipping; but there are occasional regattas.

As we have already said, in the early part of the present century every writer alluded to the incessant growth of sea-bathing places; the process of their creation still continues, and for various reasons. We tire of old places, and have a craving for novelty. A watering place if it once becomes fashionable, is crowded and expensive; and many people like quieter and less expensive quarters, which they can only find in new stations. Then the number of well-to-do people who wish to take their families to the sea-side has increased along with the wealth of the country, and more accommodation is required. For these reasons not a year passes by without some new bathing place being recommended to the favour of the public.

One of the last of these in this part of England was Hayling Island, a low, flat island surrounded by tidal inlets, lying south of Havant and east of Portsmouth. Hotels and lodging-houses, and the usual sea-side conveniences, sprang up with great rapidity along its southern shore. We do not learn that Hayling Island had ever much to recommend it, except its seclusion; and now that the railway has reached it, it will not long enjoy that advantage. Its climate is essentially the same as that of Bognor and Littlehampton.

We have still a word or two to say respecting a variety of salt-water bathing, one by which many persons profit who cannot bear the open sea.

Warm sea-baths are generally to be procured in all large watering places; and they have been more used of later years in England than formerly. A French physician, Dr. Foubert, has recently written at some length respecting them, and recommends them—(1) for young children, or those who have been weakened by scrofulous suppuration; (2) for people of advanced years, and for younger ones having an excessive tendency to catarrhs, whether of the respiratory or of the alimentary organs, and who cannot bathe in the open sea without catching cold; (3) in many excitable, nervous women and children who cannot bear the shock of cold water; (4) in the special treatment of female complaints; (5) in rheumatic and gouty conditions; (6) in affections of the liver or other abdominal organs; and in cases of biliary or nephritic calculus. It is much to be wished that the operation of hot salt water baths in these and in similar affections should be thoroughly studied by our own medical men.

Law Reports.

ADULTERATED BUTTER.

AT Lambeth, H. Bond, grocer, Diamond Street, Camberwell, has been summoned by inspector Fraser for selling adulterated butter. A quarter of a pound, purchased at the defendant's shop, was examined by Dr. Bernays, had a disagreeable smell, and tasted of tallow and dripping. On examination it was found to be adulterated with fat other than butter. The defendant's wife declared that the butter was sold in the same state as purchased. Mr. Ellison said that that was no justification. Tradesmen were bound to sell pure butter. Dr. Bernays deposed that there was an adulteration of 20 per cent. of fat, not butter. Mr. Ellison inflicted a penalty of 20*s.* and 12*s.* 6*d.* costs.

ILL-CONDITIONED PIGS.

AT Wandsworth, J. Freeman has been summoned for conveying certain pigs suffering from a contagious disease along a highway. On July 4 the defendant offered R. Bennett, landlord of the Grosvenor Arms, six pigs for sale. Bennett remarked that they did not look healthy, but the defendant said he bought them late on Saturday, and that they had been in the van ever since. The defendant having guaranteed the pigs to be as healthy as those belonging to Bennett, he purchased them, but one died two hours afterwards, and the remainder had to be killed. The bodies were examined, and it was found that the pigs had been suffering from disease of the liver and lungs. Witnesses were called to prove that the pigs were healthy when they were sold. Disease in pigs would come on in a very short time, and an unskilled person could not detect it. The magistrate said the defendant must have known the pigs were diseased, and fined him 3*l.* and 2*l.* costs, or two months' imprisonment.

OFFENCES AGAINST THE REGISTRATION ACT.

A REGISTRAR for a parish in Lewis (Scotland) has been tried at Stornoway on a charge of omitting to register the births, deaths, and marriages which had occurred in his district. The offences charged against him numbered 143, and the penalty to which he had thus become liable was stated to be 1,430*l.* He pleaded guilty to one offence under each of the three heads, and the sheriff imposed a fine of 3*l.* An official from the Register House, Edinburgh, had thereafter a meeting with the other registrars of the island, and warned them of the consequences of omissions in the performance of their duty.

UNSAFE PETROLEUM.

AT Guildhall, J. Roller, a feather dyer, of 3, Red Cross Street, has been summoned for keeping petroleum which gave off an inflammatory vapour at a less temperature than 100 degrees Fahrenheit, without a licence. The inspector stated that he went to the defendant's premises and ascertained that there were about nine gallons of benzone there for cleansing feathers, afterwards he went there with a search warrant and seized the petroleum. He tested it and found that it gave off an inflammable vapour at 70 degrees. It was admitted that it had been on the premises for at least three months. The defendant was liable to a penalty of 20*l.* per day, but he was summoned only for one day. The defendant said that he bought the benzone from a very respectable manufacturer, and he gave him no caution that he required any licence to keep it. When he found that it would not answer for the purpose for which he bought it he put it aside to be taken away. He did not know that it was petroleum. Sir T. Dakin said that every one was supposed to know the law. It was not alone the danger he was in himself of having his own premises destroyed by keeping such an inflammatory material in his warehouse, but the chance there was of other persons' premises being burnt also. This benzone was undoubtedly petroleum within the meaning of the Act, and it flashed at less than 100 degrees of heat. He must impose a fine of 5*l.* and costs. Mr. Kirby applied that the petroleum might be condemned. Sir T. Dakin acceded to the application.

NOVEL APPLICATION.

A NOVEL application was made recently to the Court of Queen's Bench, *Ex parte Baker, in re Wisbeach Sewers*. In this case the Commissioners of Sewers for Wisbeach had given notice of a 'Special Session,' to consider some new drainage works which a Mr. Baker apprehended would be detrimental to his property. He, therefore, retained counsel, who attended at the time appointed, and claimed to be heard. After some delay he was introduced into the room, and informed by the chairman, with much politeness, that 'the business was concluded,' and that the Commissioners would meet again in November. 'But mind,' said the clerk, 'we shall not hear you then.' Upon this an application to this Court was resorted to.—Mr. H. Brown moved for a *mandamus* to the Commissioners to hear him, or a prohibition to restrain them.—The Lord Chief Justice observed that if the Judicature Act came into operation, the Court would be able to assist him, but at present his only remedy was in chancery.—Mr. Justice Quain: You could bring an action, and then on recovering judgment, you can obtain an injunction from the Court of Law, but you cannot obtain except in chancery an injunction against mischief to be apprehended.—Mr. Brown observed that the remedy by action would be like shutting the stable door after the horse was stolen. Surely his client was entitled to be heard before his property was, perhaps, irreparably injured.—The Lord Chief Justice said the learned counsel might, if he pleased, take a rule *nisi* for a *mandamus* to the Commissioners to hear him before proceeding.

BRIEF NOTES OF CASES.

GAS COMPANY POWERS.

1875. *Commercial Gas Co.* v. *Scott.* 'Gasworks Acts, 1847, 1860, 1871.'—Unjustifiably cutting off supply of gas.—Penalty.—Company held rightly convicted. (W. N., 1875, 129; 32 L. T., 765.)

RATING MARINE PROPERTY.

1875. *Cory* v. *Bristow.* Rating of derricks moored in the Thames on sites held under license determinable at pleasure.—Held that such occupation did not involve liability to rates. (W. N., 1875, 94; 32 L. T., 797.)

OVERCROWDING.

1875. *Rye Union* v. *Paine.* 'Sanitary Act, 1866,' section 19.—Overcrowding.—Held that this enactment extends the 'Nuisances Removal Act, 1855,' and that there may be a conviction for overcrowding though only one family be concerned. (W. N., 1875, 119; 32 L. T., 757; 39 J. P., 375.)

VOTING.

1875. *Smith* v. *Seghill Overseers.* 'Poor Rate Assessment Act, 1869,' section 19.—Workmen occupying tenements at the will of their employer and paying no rent held to be 'occupiers' entitled to the franchise. (45 L. J. M. C., 114; W. N., 1875, 129; 39 J. P., 405.)

LIABILITY FOR 'DANGEROUS STRUCTURE.'

AT Lambeth Police Court, the Rev. J. F. Lingham, rector of St. Mary's, Lambeth, has been summoned for 1*l.* 15*s.* and 38*l.* 8*s.* 2*d.*, the cost of surveying and shoring-up the wall of St. Luke's churchyard, Norwood. The application was made under the Dangerous Structures Act, and the contention was that the defendant was liable for the expense of the survey, and also of the shoring of the wall of the churchyard of St. Luke's, which was certified to be in a dangerous state. About twelve months since a summons was taken out at this court, and Mr. Chance made an order that the work should be done, and, in default, the Metropolitan Board of Works be empowered to carry out the same and recover the cost. The Board had the work done, and now sought to recover the same from the defendant on the ground that in law he was 'the owner of the churchyard' and responsible for it being kept in repair. The district was created in the 58 Geo. III., and the church established in 1825 in consequence of the increase of the population. At a vestry meeting in 1819 it was resolved to build four new churches, known as St. John's, Waterloo Road: St. Mark's, Kennington; St. Matthew's, Brixton; and St. Luke's, Norwood. Mr. White did not dispute that the sum claimed had been expended, but he submitted that St. Luke's was distinct from the mother church of St. Mary, and that the incumbent of St. Luke's was responsible. It would be very hard indeed on Mr. Lingham that, being the rector of the mother church, he should be made liable for all the four churches as well as for his own. Mr. Ellison said he was of opinion that the defendant was not responsible, and dismissed the summons. Mr. Lingham was paid 5*l.* 5*s.* for costs.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

BARROWCLOUGH, Mr. Charles, has been appointed Surveyor to the Wooldale Urban Sanitary Authority.

BULLMORE, Wm. King, M.D. Univ. St. And., M.R.C.S. Eng., L.S.A. Lond, has been appointed Medical Officer of Health for the Falmouth Parish Urban Sanitary District: 20*l.* per annum.

CAVE, Mr. John, has been appointed additional (third) Inspector of Nuisances to the Preston Urban Sanitary District.

DAVIES, Mr. Elias, has been appointed Inspector of Nuisances for the Conway Rural Sanitary District, vice Fisher, resigned.

DAVIES, Henry Harries, M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Llandyssul Sub-District of the Newcastle-in-Emlyn Rural Sanitary District, vice Jones, deceased.

PUGH, Mr. Charles, has been re-appointed Inspector of Nuisances for the Kidderminster Urban Sanitary District.

RUSBY, Mr. Joseph, has been re-appointed Clerk to the Nether-Thong Urban Sanitary Authority till March, 1876.

VACANCIES.

BLACKBURN. Town Clerk: 1,000*l.* per annum, offices, stationery, etc.; Surveyor: 450*l.* per annum, clerks, office accommodation, stationery, etc. Applications, 31st instant, to C. G. H. Beck, Town Clerk.

BURSLEM URBAN SANITARY AUTHORITY. Surveyor: 160*l.* per annum, a commission of 5 per cent. upon outlay on private streets, 20*l.* as Surveyor to the Burial Board, and permission to hold a certain Turnpike Road Surveyorship at 70*l.* per annum. Medical Officer of Health: 50*l.* per annum. Applications, 30th instant, to J. W. Powell, Clerk to the Authority.

CLAY LANE URBAN SANITARY AUTHORITY. Clerk. Application, October 1, to Mr. Mycroft, Clerk *pro tem.*, Clay Cross.

DALKEITH. Certifying Factory Surgeon.

DERBY URBAN SANITARY AUTHORITY. Surveyor, and Surveyor to the Corporation: not exceeding 500*l.* per annum, office accommodation, and services of a Clerk. Application, 31st instant, to Joseph Jones, Clerk to the Authority, and Town Clerk.

DEWSBURY URBAN SANITARY AUTHORITY. Surveyor, and Surveyor to the Corporation: not exceeding 150*l.* per annum. Application, 30th instant, to Jesse Smith, Town Clerk.

GOLCAR URBAN SANITARY DISTRICT, combined with several others (usually called the Colne Valley District): Medical Officer of Health. Application, 11th September, to J. B. Robinson, Chairman, Marsden Urban Sanitary Authority.

KINGSTON-UPON-HULL URBAN SANITARY AUTHORITY. Clerk, Town Clerk, Clerk of the Court of Record, and Steward of the Manor of Myton.

LINTON RURAL SANITARY DISTRICT. Inspector of Nuisances: 80*l.* per. annum. Application, 8th September, to J. T. Collin, Clerk to the Authority, Saffron Walden.

NETHER-THONG URBAN SANITARY DISTRICT. Surveyor.

RHYMNEY URBAN SANITARY AUTHORITY. Clerk.

TUNSTALL URBAN SANITARY AUTHORITY. Surveyor: 100*l.* per annum. Application, 6th September, to H. W. Ackrill, Clerk to the Authority.

SANITARY PATENTS.

2303. Traps for preventing the passage of noxious gases from sewers, etc. Edward Gregson Banner, Billiter Square, London.

2266. Drying or pulverising sewage deposit, etc. Robert Milburn, Church Lane, Whitechapel, London, and Henry Jackson, Park Square, Leeds, Yorkshire.

2292. Water supply of water-closets, etc. Alfred Tylor, Newgate Street, London.

2286. Treating phosphates. Alexander Browne, Gracechurch Street, London.

2510. Hydraulic apparatus for watering streets, etc. Edward Paget, Gillham Headly, Cambridge.

211. Producing gas from an admixture of atmospheric air with paraffine, petroleum, etc. J. Mather, Gateshead-on-Tyne.

2437. Hermetically sealing and preserving food, etc. George de la Perrelle, Liverpool.—A communication from Pierre Guérin.

2316. Chloride of lime. William Riddell, Foulden Road, Stoke Newington, London.

2594. Improvements in water meters. John Macneill, South Kensington, London.

ABSTRACTS OF SPECIFICATIONS.

373. Manures. H. Y. D. Scott, Ealing.

The object of this invention is the production from fæcal matters of manures sufficiently concentrated to command a ready market without the creation of a nuisance in the process. Instead of employing deodorants of a bulky and, as respects fertilising properties, inert nature, the inventor makes use in some of the closets of coal soot which contains considerable quantities of ammoniacal salts, and in others the inventor applies as a deodorant lime, which is subsequently neutralised with phosphoric acid in a soluble form combined or uncombined with a base. The combined matters are afterwards stirred in a pug mill and then dried and reduced to a powder.

378. Double and single sealing stench traps. J. B. Buckley and E. Stock, Oldham.

The traps are intended to be used for slop stones, streets, washing basins, baths, and in any place where stench traps are required, the outer forms of the traps and the positions of the pipes or passages through which the liquids or sewage pass being arranged according to the various requirements. In one arrangement, the trap consists of an outer vessel having three partitions, two extending from the top to about three-fourths of the depth of the vessel, and the last extending from the bottom to about one half the depth of the vessel, there being an inlet to the outer vessel, a cover over the two partitions, and an outlet from the last partition to the outside of the vessel. The liquid or sewage passes into the outer vessel and rises about midway, extends about one-fourth above the bottoms of the two partitions, and runs off over the top of the last partition; and as there are three partitions containing the liquid or sewage, there is a double seal, which effectually prevents the escape of any noxious smell or poisonous gases. The single trap consists of an outer vessel having two partitions, one extending from the top to about three-fourths of the depth of the vessel, and the other extending from the bottom to about midway, there being a perforated lid for the admission of the liquid or sewage, and at the bottom, outside the second partition, an opening for its escape, and as the liquid or sewage rises above the bottom of the first partition and runs off over the top of the second partition, a trap having a single seal is effectually obtained.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer—not necessarily for publication.

DETERMINATION OF OZONE.

PROFESSOR PETTENKOFFER and Dr. Wolffhügel show, in *Centralblatt für Agrikultur. Chemie*, that there is a great want of accuracy in the methods adopted for determining ozone in the air. The methods in use are ozonoscopic rather than ozonometric. They contend that the volume of air which sweeps over the ozone papers, in a given time, should always be determined.

ACTION OF THE SUN'S RAYS.

A CURIOUS experiment has recently been made to ascertain how far the sun can penetrate the water. The research was conducted upon the lake of Geneva, whose waters are among the clearest of the Swiss lakes, and the results have recently been communicated to the Society of Natural Sciences in the canton of Vaud, by M. Forel. He found that the chemical action of the sun's rays was felt in the summer at the depth of from forty to fifty metres.

THE GROWTH OF LONDON.

DURING 1874 there were built in London 7,764 new houses and 145 new streets, and two new squares were formed, the length of the new streets and squares being 22 miles and 862 yards. 3,542 new houses were in course of construction. The length of new streets and squares opened during the last quarter of a century is 1,181 miles and 54 yards. There does not appear, according to the return, to be any immediate prospect of a cessation in the growth of buildings: the tendency is rather the other way.

METROPOLITAN WATER-SUPPLY.

THE average quantity of water supplied daily to the metropolis during the preceding month was, according to the returns of the water companies to the Society of Medical Officers of Health, 121,381,916 gallons, and the number of houses supplied was 518,127. This is at the rate of 36·9 gallons per head of the population daily. The last official return from Paris stated that the average daily supply per head of the population was 31·4 gallons, but this includes the water used for the public fountains and for the ornamental waters in the Bois de Vincennes and the Bois de Boulogne.

TO SAVE THE DROWNING.

THE Massachusetts Humane Society has published very brief and intelligible directions for saving the lives of persons rescued from the water after they have become insensible. They are as follows: 1. Lose no time. Carry out these directions on the spot. 2. Remove the froth and mucus from the mouth and nostrils. 3. Hold the body, for a few seconds only, with the head hanging down, so that the water may run out of the lungs and windpipe. 4. Loosen all tight articles of clothing about the neck and chest. 5. See that the tongue is pulled forward if it falls back into the throat. By taking hold of it with a handkerchief it will not slip. 6. If the breathing has ceased, or nearly so, it must be stimulated by pressure of the chest with the hands, in imitation of the natural breathing; forcibly expelling the air from the lungs, and allowing it to re-enter and expand them to the elasticity of the ribs. Remember that this is the most important step of all. To do it readily, lay the person on his back, with a cushion, pillow, or some firm substance under his shoulders; then press with the flat of the hands over the lower part of the breast bone and the upper part of the abdomen, keeping up a regular repetition and relaxation of pressure twenty or thirty times a minute. A pressure of thirty pounds may be applied with safety to a grown person. 7. Rub the limbs with the hands or with dry cloths constantly, to aid the circulation and keep the body warm. 8. As soon as the person can swallow, give a tablespoonful of spirits in hot water, or some warm coffee or tea. 9. Work deliberately. Do not give up too quickly. Success has rewarded the efforts of hours.

Communications have been received from:

The Secretary of the Dublin Sanitary Association; Mr. Thomas Whiteside Hime, Sheffield; Mr. E. Phillips, London; Dr. James B. Russell, Glasgow; Mr. G. F. Chambers, Eastbourne; Mr. Joseph Newton, C.E., Balham; Mr. Alfred Haviland, Northampton; Mr. P. H. Holland, London; Dr. T. W. Grimshaw, Dublin; Mr. G. F. Heath, Paignton; Mr. Alderman Bailey, Salford.

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Original Paper.

HYGIENE.

BY F. S. B. F. DE CHAUMONT, M.D., Edin.

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CHAPTER IV.—HABITATIONS.—*Continued.*

2. *Artificial Ventilation.*—Various plans of artificial ventilation have been recommended, but they all fall into two categories, viz. :

(*a*) Propulsion.

(*b*) Extraction.

(*a*) *Propulsion.*—For ordinary habitations any method of this sort is almost quite inapplicable, but it may be useful occasionally, under certain circumstances, in large buildings, in ships, and the like. Experience, however, has shown that in buildings it is very inefficient as compared with natural methods. In the tropics, however, or in very hot weather in temperate climates it is useful, for then the natural ventilation is much interfered with. It may be carried on either by revolving fans or by pumps of various constructions. Of the former, the thermantidote, so well-known in India, is an example ; it is a modification of the wheel of Desaguliers, and is a wheel formed of flanges on an axle, which drive a current of air along a tube when the wheel is set in motion. By covering the opening through which the outer air enters the apparatus with wetted kus-kus tatties (or mats), a pleasant, cool, moist current is produced which is exceedingly grateful in the dry hot air of a tropical summer. Of the forms of pumps, which are various, perhaps Arnott's is the most simple and efficacious. All these plans, however, are very expensive, as requiring the labour either of men or machines, and may therefore be almost totally disregarded for ordinary purposes.

(*b*) *Extraction.*—This may be carried on either by means of machinery, such as fans or pumps, or by the agency of heat. The former plan is open to the same objections as the propulsion by machines, but the latter may often be employed with advantage ; it is, in fact, merely promoting what we have called natural ventilation in the most effective way. The importance of this method was first definitely pointed out in the last century by Mr. Sutton, a brewer, who proposed its application to ships of war. It is unquestionably the best form of artificial or assisted ventilation, for it is quite clear that if we help foul air out of a space, some air must come in to take its place ; it is of course our part to see that the air that does come in is fresh air, by providing proper inlets for it. Extraction is promoted by heat in the ordinary chimney, or in the outlets that pass up in or around it, the main point to attend to being to have the outlet shaft, whatever may be its form, carried up the warmest part of the air-space.

3. *Shape and Arrangement of Ventilating Tubes.* Under this head the main point to be aimed at is to lessen as much as possible the effects of friction ; for which purpose angular corners or bends ought to be avoided. The shape of a tube ought therefore to be round or oval as much as possible, very seldom square or oblong (*i.e.* with straight sides). It is also to be borne in mind that every bend in a tube increases the difficulty of air passing freely along it ; bends should therefore be avoided if possible, but when they are necessary, as they often must be, the angle should be as great as possible, and rather a curved bend than an angle by preference. Dividing a tube or its orifice into several smaller openings also increases friction and lessens the amount of air obtainable, so that when this requires to be done the sum of the sectional areas of the small openings ought to be greater than the sectional area of the original tube. The loss by all these interfering conditions is considerable, and may even practically reduce the influence of the ventilator to a minimum.*

3. *Cubic Space.*—We have seen in the general remarks on ventilation that the question of cubic space was one that had really nothing to do with the supply of fresh air, in so far as that under most circumstances the condition of the air space became constant within a short time of the commencement of its occupation, so that no amount of initial cubic space could be held to compensate for an insufficient supply of fresh air. But the question is one that has its own value in considering the feasibility of the means of ventilation available, as well as the possibility and expense of warming the air spaces ;

* The following points may be noted on this subject :—

a. Shape of sectional area.—Of all rectilineal four-sided figures, the square encloses the largest area within the least length of side, for, if we have a square of 10 feet, = 100 square feet, and make an oblong figure equal to it with one side, say 12 feet, it is obvious that the other side must be $\frac{100}{12} = 8{\cdot}33$, and the sum of the four sides will therefore be 40·66 against 40, or an increase of area of friction by 1·6 per cent. Of other figures, we may say that in regular polygons the area of friction is inversely as the number of sides, being diminished the more they approach the circle. In irregular figures, the friction increases according to the difference between the length of the different sides. Again, of all curvilinear figures, the circle encloses the greatest space within the least length of side, for, if we have a circle whose diameter is 10 feet, it will have an area of 78·54 square feet enclosed within a length of side (*i.e.* the circumference) of 31·416 feet ; whereas an ellipse of the same area will have a circumference of something more in proportion to the difference between the major and minor axes. Thus, if the major axis be 12 feet, the minor axis will require to be 8·33, and the circumference will be 31·912, or an increase of area friction of 0·496 or about 1·6 per cent. The following table will give an idea of the relative surface along which a current would have to pass, according to the shape of the sectional area of a tube.

Shape of section.	Area	Total length of periphery.	Coefficient of friction, circle being 1·000.
Circle	100	35·45	1·000
Ellipse, E = ½	100	35·67	1·006
Dodecagon	100	35·86	1·012
Heptagon	100	36·72	1·036
Hexagon	100	37·22	1·050
Pentagon	100	38·12	1·075
Square	100	40·00	1·128
Rectangle (sides 4 : 5)	100	45·41	1·281
Equilateral triangle	100	45·59	1·286
Right-angled isosceles triangle	100	48·28	1·362
Triangle, sides about right angle as 4 : 5	100	48·71	1·374
Triangle, sides about right angle as 2 : 3	100	49·69	1·402
Triangle, sides about right angle as 1 : 2	100	52·36	1·477

b. Division of area.—When an opening is divided into a number of smaller openings, the total area remaining the same, the loss by friction is in the ratio of the square roots of the areas. Thus an opening of one square foot area is

for we must not only supply enough of air, but we must also do this, in such a way, as that no unpleasant draughts shall be perceptible by the inmate. Bearing in mind that a velocity of one and a-half to two feet per second is appreciable by most persons, and, probably, even less if the air be very cold, we should try to arrange so that at no part of the air space in the neighbourhood of the inmate the rate should be much above this. For this purpose the sectional area of the ventilators must be sufficiently large, whilst the cubic space must be sufficiently great to render it unnecessary to change the whole air more than a certain number of times an hour. Now these two quantities are interdependent, and we may lay it down as a general principle that the sectional area of the ventilators should be inversely as the cubic space, so that, if the latter be diminished, the former ought to be increased in proper proportion. If the cubic space be small, it is almost impossible to keep it pure unless the incoming air be warmed, for cold air will produce such draughts as will be quickly resented; whilst, on the other hand, if the cubic space be inconveniently large, the warming becomes a matter of expense, and the change of air is difficult to accomplish uniformly and continuously. It is unadvisable to change the air of any inhabited space oftener than three times an hour on an average, unless the air be specially warmed, when it may be done oftener; therefore, to give 3,000 cubic feet of air per hour a space of at least 1,000 cubic feet per head would have to be provided. If, however, this be (as sometimes must be) impossible, then means should be taken to raise the incoming air to a temperature as near as possible to that of the air space. A velocity of unwarmed air amounting to five feet per second is as rapid as is advisable at the point of entry, so that on this basis an air space of 1,000 cubic feet ought to have about one square inch for every 40 cubic feet of space, or 25 square inches of total inlet area, and of course an equal amount of outlet area; this would provide for a movement in both directions of a little over 3,000 cubic feet per hour. If now a greater space be given, a greater velocity at the points of entry and exit might be borne, but if the space be diminished so must the velocity, and the two extremes may be considered to meet; for if the space be infinitely increased, the ventilation may be infinitely diminished, whilst if the space be reduced to the amount a man requires to stand up in, the ventilators would have to be so much increased that the containing surface would be to all intents and purposes done away with; so that in both cases he might be considered to be in the open air. I think a fairly safe rule would be to add on five square inches of total inlet and outlet area for every 100 cubic feet of space less than 1,000—so that we should have the following scale:

Cubic space.		Total sectional area of inlet and outlet.
1,000	cubic feet	50 square inches.
900	,,	55 ,,
800	,,	60 ,,
700	,,	65 ,,
600	,,	70 ,,
500	,,	75 ,,
400	,,	80 ,,
300	,,	85 ,,
200	,,	90 ,,
100	,,	95 ,,

A greater amount than 1,000 cubic feet per head is seldom likely to be provided, but, if it were, a diminution in the sectional area might be admitted, but not in the same proportion; for instance, 25 square inches would probably be enough for 2,000 cubic feet, but it would hardly be advisable to go much below this, however great the cubic space might be—both because the friction would be much increased, and because the risk of stoppage at any moment would be greater.

A further limit requires to be put to the question of cubic space, and that is, that the space laterally must bear a due proportion to height. It has been an error, not uncommon, to suppose that, by raising the roof of an air space and so giving nominally the proper amount of cubic space, the want of room laterally was compensated for, and that the inmates might in this way be crowded together to any extent. Nothing could be more erroneous, and its absurdity becomes at once manifest if we suppose a man put at the bottom of a deep well or pit; the space above

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divided into 4 equal parts, each of course being ¼ of a square foot; the relative amounts of air passing through will be as the square root of 1 to the square of ¼, or as 1 to ½, so that we lose half our available air by the division. If, therefore, it be necessary to substitute for a single opening several smaller openings, the total area must be greater than the area of the original opening, which may be obtained either by increasing the number of openings or by making each greater than an aliquot part of the original opening. The following short table shows the number of parts and their area, whose sum would make up an area sufficient to neutralise the effects of friction.

Original area of single opening.	No. of parts into which the original opening is divided.	Area of each part.	Total area of parts.	Ratio to original area.
1 square foot.	2	0·707	1·414	$1 : \sqrt{2}$
,,	3	0·574	1·732	$1 : \sqrt{3}$
,,	4	0·500	2·000	1 : 2
,,	5	0·459	2·236	$1 : \sqrt{5}$
,,	6	0·408	2·449	$1 : \sqrt{6}$
,,	7	0·378	2·646	$1 : \sqrt{7}$
,,	8	0·353	2·828	$1 : \sqrt{8}$
,,	9	0·333	3·000	1 : 3
,,	10	0·316	3·162	$1 : \sqrt{10}$
,,	11	0·302	3·317	$1 : \sqrt{11}$
,,	12	0·289	3·464	$1 : \sqrt{12}$

c. Effects of angles in tubes.—When a tube is bent at an angle the coefficient of friction varies with the square of the sine of the angle, according to the formula:

$$F = 1 + \sin.^2 \theta,$$

and the amount of air obtainable will be represented by the formula:

$$D = \frac{VA}{1+\sin.^2\theta} = \frac{VA}{F},$$

where F = coefficient of friction, A the sectional area of the tube, V the velocity of the air-current, D the amount of air delivered, and θ the angle of the tube. The range may be considered as between the limits of $\theta = 0°$ and $\theta = 90°$, or the coefficient of friction varies between unity and 2, so that $= 90°$ gives one-half; or, a tube bent at a right angle will deliver only one-half as much air as the same tube straight. When there is more than one angle, the coefficient will be the product of the separate coefficients of the angles, so that a tube having two right angles in its course would only deliver one-fourth of the amount delivered by the same tube straight.

From the above it may be seen how much the movement of air may be impeded, and we may give an example.

If a single straight circular tube delivers 100 cubic feet of air per minute, a square tube, divided into four parts and bent twice at a right angle, will deliver the following:—

Ratio of square to circle.	Coefficient for division into four parts.	Coefficient for two right angles.	
100 ÷ (1·128	× 2	× 4)	= 11·1 cubic feet,

or, in round numbers, nine-tenths of the available air will be lost.

is illimitable, but he has a strong chance of perishing for want of air. So also cases have been known of persons being suffocated in a crowd in the open air where there was nothing between the tops of their heads and the outer limits of the homogeneous atmosphere. It is therefore necessary to lay down some limiting rule, and I think we may safely say that nothing over 12 feet in height ought to be reckoned in estimating cubic space for ventilating purposes. This, with a total of 1,000 cubic feet, would give about 84 square feet of floor-space, or 12 feet by 7. When the cubic space is much diminished below 1,000, the lateral space ought, if possible, to bear a greater proportion, so that the limit of height might with propriety be placed at 10 feet for spaces of 500 cubic feet and under.

FORM, ARRANGEMENT, AND MATERIALS OF HABITATIONS.

1. *Form and Arrangement.*—It is a matter of some difficulty to lay down any abstract rule for the form of dwelling to be best adopted, as it must be governed by considerations of position, convenience, expense, material, etc. We may, however, say a few words with regard to this question, dividing it into three parts :

a. Private dwelling-houses.

b. Public buildings of various kinds for people in health.

c. Hospitals.

a. Private Dwelling Houses.—In large communities, such as towns and cities, the form of house has in most cases to be adapted to the general plan of the street or quarter in which it is situated, but in smaller or more widely scattered communities more latitude is possible. In a climate like ours warmth is one of the first essentials, and the economy of fuel requires to be attended to on account of its great and increasing expense. A house, therefore, in which the greatest warmth can be obtained with the least expenditure of fuel, is desirable, and this can, I think, be obtained by having a central hall which can be heated, and from which the various dwelling rooms should radiate. When the hall is circular or square, and lighted from above with air-outlets through the cupola, an excellent form of dwelling can be obtained. Fresh air could be brought in below and warmed before delivery, whilst the cooling effect of draughts from the outer door could be obviated by having a second door, which in winter might be closed whilst the outer door is opened. In the rooms themselves the fireplaces should be either in the wall on the hall side, or in the party wall between two rooms. In the form of house proposed by Drs. Drysdale and Hayward (already referred to), most of these points are indicated, differing, however, in this way that in their houses the whole of the fresh air is brought in through the lobby or hall, and all the foul air taken out through one great shaft. There are thus, no direct outlet for the hall itself, no fireplaces in the rooms, and no open windows or other direct inlet for cool air; of course in summer the air would be delivered into the hall unwarmed. Good as the theory of the plan is in several points, I should hardly feel justified in wholly commending it, not having any personal knowledge of its efficacy or practicability; the method of extracting foul air, however, through one great shaft, assisted by heat, is decidedly a good one. The actual shape of a room, where a choice is possible, depends a good deal upon its size, but I believe one of the favourite shapes with architects is one where the length is equal to the square root of twice the square of the breadth, or where the room is a little less than twice as long as it is broad : for instance, a room 20 feet long ought to be about 14 feet broad, and so on in proportion. In the case of a very large room, heating by pipes or some such arrangement is necessary, or else more than one fireplace is required ; in the latter case, inconvenience is often caused by a down-draught in the chimney should proper inlets not be supplied elsewhere, and the same thing occurs in the case of outlets over gaseliers, etc., in the absence of proper inlets. Windows on two opposite or contiguous sides of a room are often objected to on æsthetic grounds, and they are certainly cold in winter, but they are good on hygienic grounds, as giving an opportunity for plenty of air when required, with the additional advantage of plenty of light—a necessity for health too often neglected. The height of a room ought to be governed by its size, as far as symmetry goes, but no part of the height above 12 feet ought to be reckoned as cubic space for ventilation purposes, while even a small room ought not to be less than 10 feet high, if possible, particularly where gas is used. A southerly, south-westerly, or westerly exposure is generally the favourite one for a sitting-room, but for a study or work-room a northerly or north-easterly is preferable, on account of the steadiness of the light, which renders it both more agreeable to work with and less trying to the eyes. In the case of a bed-room to be occupied merely as a sleeping-room, the exposure is less important, but the other points already referred to would hold good regarding it. Where cross ventilation is possible it is even more desirable, attention being paid to keeping up a proper temperature. In all circumstances the form and arrangement of the room should be such that the bed should stand free from the walls on three sides at least ; if any part must be close to the wall, it ought to be an end, and not a side if possible. The bed itself ought to be of metal, and as free as possible from curtains, drapery, hangings, etc., as ought also the windows and rest of the room.

A very important point is the position in a house of the water-closets and the sinks for bed-room slops. As far as possible these ought to be outside the house, either in an *annexe* built on, or in a separate structure connected by a passage, with complete ventilation and well-fitting doors, so as to shut off all chance of gas escaping into the house itself. Under no circumstances ought there to be a closet opening directly into a bed-room, the merely occasional convenience of such an arrangement being more than counterbalanced by its danger and generally objectionable situation. In some houses, however, particularly in older houses in towns, I have seen this arrangement, not only in single instances, but in all the closets of the house, so that access to one was only obtainable through a bed-room. Almost equally objectionable is the arrangement where the closet opens on to the lobby or landing close to the bed-rooms or sitting-rooms, a plan both unhealthy and in every way offensive.

A plan of building houses is not unfrequently followed, as in the so-called Italian villa, where the staircase is placed in a separate tower ; this economises space and makes a handsome appearance, but it somewhat increases the difficulties of ventilating the lobbies. An intelligent architect, however, would probably soon find means of overcoming these.

b. Public Buildings of various kinds, for People in Health.—These we may divide into—1. Places for temporary occupation, such as churches, theatres, concert-halls, meeting-halls, schools, workshops, etc.; and 2. Places for permanent occupation, such as boarding-schools, barracks, workhouses, prisons, and any places where numbers of persons are collected together, either in large dormitories or separate small rooms or cells.

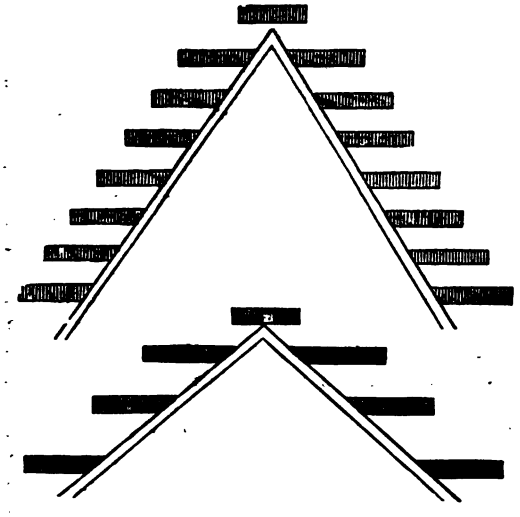
1. *Places for Temporary Occupation.* — Such places as theatres, churches, etc., are generally selected (or at least are supposed to be so), for their acoustic properties, and the conditions affecting the health and comfort of the occupants have been in most cases too little studied. The chief points to be borne in mind are that no part should be unprovided with means of ventilation, particularly outlets for foul air, and consequently that irregularities of shape and structure should be avoided wherever occupants are to be placed; and that sufficient arrangements should be made for delivery of fresh air, thoroughly warmed in cold weather. It ought always to be borne in mind that cold currents are perpetually flowing down the walls of buildings, and therefore seats ought to be kept a little away from them, if possible, unless special means of heating are provided. Up to very recently (and, perhaps, even still) some most preposterous methods of heating large buildings were in use, consisting in closing up all outlets, and passing the air under the floor through a heated chamber and then delivering it again into the room. Nothing but headache, malaise, faintness, drowsiness, and such like could come of such a plan; and probably the fact that fresh air will find its way in, in spite of the obstructions of the ignorant and unscientific, has proved the means of preventing even worse results; for air, baked even to redness, so as to destroy all organic substances, if breathed over and over again, would cease to be capable of supporting life after a certain time. In schools where the inmates are chiefly of tender years, and where, consequently, pure air is of even more importance, attention to proper principles of construction is absolutely required. The form of the rooms ought to be as simple as possible, so that the least possible opposition to perfect interchange of air may take place, whilst mere height ought not to be allowed to make up for want of lateral space. Even with children 2,000 cubic feet of fresh air per head per hour would be barely sufficient to keep the room sweet, and this could hardly be borne unless the air were previously warmed, or an almost hopelessly large amount of cubic space provided. If 400 cubic feet of space be provided, the air would have to be changed between five and six times an hour, a velocity which must produce draughts at any thing but moderately warm temperatures. A school-room to hold twenty pupils ought to have a floor space of about 850 square feet, provided the height be not less than 12 feet; this would give about 500 cubic feet per head, which could, with warmed air, be changed four times in the hour. Such an arrangement would keep the respiratory impurity down to 0·2 of carbonic acid per 1,000 volumes, assuming that each child gave off about 0·4 of a cubic foot per hour. Nothing short of this will keep a room sweet if the occupation is to be continuous for many hours, but with it one class may succeed another in the same room without bad consequences. Where less perfect means of ventilation exist there ought to be an interval at fixed periods, every hour if possible, during which the rooms should be empty and well flushed with fresh air from all possible directions.

The form and arrangements of a workshop must depend greatly upon the trade, but under all circumstances the freest supply of fresh air of a fair average temperature ought to be kept up, and all obstructions carefully avoided by the proper disposal of bulky furniture and machines, and having as little irregularity of construction as possible. It should be borne in mind that during active work, mental or bodily, much more impurity, both from lungs and skin, is given off, amounting in some cases to double the amount in a state of repose. There are, besides, other sources of impurity arising from the articles of trade, machinery, etc., which add to the noxious condition of the air. To keep workshops thoroughly sweet, therefore, a very large amount of air is necessary, and if the cubic space must be small, the form and arrangement of the room ought to be such as to favour rapid and complete change of air. Where steam power is used there ought to be little difficulty, for there is always enough of waste steam to provide any amount of warming for the incoming air. It cannot be too frequently insisted upon that it is not only good and right to provide well-ventilated workrooms for the personal comfort and well-being of the employed, but it even pays the employer in a commercial point of view, for more and better work will be got out of the workers. The same is to be said for schools; there would be fewer sleepy and stupid children and fewer ill-tempered and capricious teachers, were the schoolrooms better constructed and ventilated.

2. *Places for Permanent Occupation.*—Under this head I would refer chiefly to places where a number of persons are brought together during the hours of repose, such as school-dormitories, barracks, workhouse dormitories, etc. The best form for such rooms is undoubtedly with windows at each side of a longish room, with the ventilation openings so arranged that the air passing to or from one bed shall not pass over another. The chief difficulty about such rooms is the question of warming, for they are, for the greater part, enclosed by outside walls, whilst the temperature is still further lowered by the extensive window-surface. This difficulty, however, will doubtless be lessened as our knowledge of the means of economising fuel advances. In the case of prisons on the cell-system, the chief object ought to be to have cells large enough to admit of such complete change of air as shall supply the amount necessary for health. If the length of the row of cells be not too great, some general system of ventilation, such as that of Sir Joshua Jebb, in use at Pentonville and elsewhere, answers pretty well; but when the row is very long the farther cells are hardly affected by it. In such a case it is better to ventilate the individual cells, which with a space of from 600 to 800 feet ought not to be difficult. In such cells as those of Chatham prison, where each has only 200 cubic feet, individual ventilation is hardly possible. Much depends upon the system, whatever it may be, being properly carried out, for, to cite an example, there are prisons supposed to be ventilated on Sir Joshua Jebb's principle, in which the essential part, the fire in the tower, is constantly omitted.

c. Hospitals.—For all hospitals, but especially for those intended for the reception of cases of zymotic (including contagious) disease, and for surgical patients, no other form than the *pavilion* should be admitted. For all hospitals it is desirable, but for

those cases it is absolutely required. There are various modifications of this form, but the essential part of it is that each ward shall be separate and complete in itself, so that it may be entirely and thoroughly shut off and isolated from the rest of the building if any necessity should arise. Each ward is a long room capable of accommodating a number of patients, the beds being ranged along the two sides, and a window being between every two beds. At the door end are the rooms required for the nurse or attendant, and at the other lavatories, urinals, and closets, so that each ward has its own requisites, which admit of its being treated as a separate establishment in case of epidemic or contagious disease breaking out. There may be more than one story in each pavilion. A main corridor connects the pavilions with one another and with the administration block; this corridor may be placed so that the pavilions stand out at right angles on one side of it, as in St. Thomas's Hospital at Westminster Bridge; or they may be on both sides of it, as in the Herbert Hospital at Woolwich and several others throughout the kingdom; or the administration block may be



Ground-plans of Pavilions in Echelon.

in the centre and the pavilions radiate from it like the leaves of a fan, as in some of the American hospitals during the Civil War; or the pavilions may lie in echelon on two sides of a triangle, a very good plan which has been proposed. The great point is to have each ward freely exposed to fresh air on all sides, and this is most effectually arrived at by the last or echelon plan, as may be seen by the accompanying diagrams. One great advantage of the pavilion plan is the ease with which additions may be made if the ground can be obtained, for pavilions may be added on to almost any extent without interfering with the general plan of the building—the only difficulty being, of course, the administration of an establishment spread over a great surface of ground.

Of late years much has been written on the question of Hospitalism, as it has been called; that is, the dangerous condition arising from the bringing together of a considerable number of sick in one building; and, among others, the late Sir James Y. Simpson was a strong advocate for the cottage system of hospitals. On this question it would be unwise to dogmatise as yet, but we may admit that the treatment of the sick in tents and huts has almost invariably been very successful, whilst much evil has arisen in large hospitals in the way of zymotic disease of various kinds. At the same time it ought to be pointed out that our experience hitherto has been mostly confined to hospitals of old standing and faulty construction, and that really well-built and hygienically arranged hospitals have not yet had a fair trial. Even with the older buildings much improvement has been effected by better ventilation, and by the modern methods of treatment, chiefly of surgical cases, as instanced by the antiseptic method of Professor Lister. On the other hand, it will probably be found in practice that it is less easy to effect complete ventilation of a cottage than is perhaps imagined. At the same time, both plans have much in their favour, and it will not do hastily to condemn either.

2. *Materials of Habitations.*—This point may be considered with reference to the general structure of the habitation, or with reference to particular parts. Habitations may be of a permanent character, such as those made of stone, brick, and concrete or mud; or of a more temporary character, such as those made of wood, bamboo, iron or zinc, canvas or skins. Some again are composite, and comprise two or more materials in their construction. Again, the roof may be flat and cemented, as in dry, warm countries, or sloping, as in colder and moister climates, and composed of stone, slates, tiles, thatch, wood, canvas or felt. It is generally the question of expense which decides upon the choice of material, but each has its advantages in a hygienic direction, according as it is well or ill adapted for ventilation, warmth and dryness. Perhaps the most comfortable house in our climate is a good brick one, provided the bricks be good and thoroughly baked, and the walls be thick enough. Unfortunately, however, modern brick buildings are too often of the most flimsy character, so that both wind and rain find their way through the walls. Bricks are very porous, so that it is possible to blow out a candle through a brick wall, strange as the statement may appear. To keep a house thoroughly dry, therefore, the wall ought to be double, with a good space between the two skins, and the outside ought to be cemented, or slated and painted, care being taken not to lay on the cement or slates until the bricks and mortar are thoroughly dry. In the same way the walls ought to be thoroughly dry inside before the interior plastering is done. Inattention to this, and too early occupation of new houses, is a fruitful source of injury to health. For small houses, an excellent combination is sometimes made of interior walls of brick and an outer wall of well-seasoned wood, painted; this keeps very dry, cool in summer and warm in winter. Stone houses are usually warm, as the stone requires to be thick and the building substantial; in general, their qualities are similar to those of the best brick buildings, and their appearance is certainly more handsome and imposing if the stone be a good one, and not too dark or discoloured. Some objections have been raised to stone houses on account of greater danger in cases of fire, the walls splitting and falling down more easily than in the case of brick. Attention to this has been specially called by Captain Shaw, of the Metropolitan Fire Brigade. Houses of concrete or dried mud are generally very warm and dry, and if properly protected by paint or a coating of plaster, will last a long time; they have

the further advantage of comparatively small expense, at least in some localities.

Except in the finest season of the year, temporary buildings are not likely to be voluntarily resorted to in this country. Wooden huts have, however, been largely used at all seasons for many years for the housing of troops, and they have been found extremely healthy. They are of course colder than houses; but they are generally better ventilated, a more constant interchange of air taking place through their thinner walls and more numerous chinks and openings. It is always well to place a hut upon a brick foundation if possible, and to have it raised a little from the level of the ground. Huts of bamboo or hurdles are found to be extremely comfortable and very healthy in tropical climates, affording shelter from the direct rays of the sun, and allowing at the same time a constant interchange of air; they can also be very easily cooled by covering them with wetted cloths or matting. The chief objections to metal buildings, iron or zinc, are the extremes of temperature in them, as they are very hot in summer and extremely cold in winter; lined, however, with wood, or canvas, or felt, they can be much improved, whilst their portability renders them of very great use in many circumstances. Tents are probably the oldest habitations of man, since he ceased to be a dweller in caves, and a well made tent is no uncomfortable abode. Originally they were made of skins, and are still so among many races; they must have been very warm, but even the modern canvas tent, flimsy as it may seem, is a great protection against cold; it is astonishing how slight a covering is sufficient to check radiation and consequent loss of heat. When the tent walls are double, as in hospital marquees, or in the tents used in India, it is as comfortable as a house. It is always well to lay down some flooring in a tent, wood if possible, or waterproof cloth; should neither of these be attainable, canvas is very good, such as pieces of old sacking, or even hay or straw; the last, however, should be frequently renewed. With a few slight precautions against damp and cold, life under canvas is about the most healthy a man can lead, provided of course he is properly fed and clothed. In times of epidemic, or for the treatment of wounded men, nothing is better than a hospital of tents.

CUPBOARDS.

In the construction of old houses, and in too many instances new ones also, a great defect is to be found in the absence of any mode of ventilation for the cupboards. This omission is a serious one in all cases, but especially in those which are devoted to the reception of food or of dirty linen. In such cases these closets, with their contents, become laboratories for the manufacture of polluted air, which from time to time escapes into the living rooms and makes itself unpleasantly apparent. The remedy for this is not difficult; a few perforations in the doors will be found serviceable, but if practicable the wall of the cupboard should also be perforated so that a thorough draught could be obtained.

For damp closets and cupboards which generate mildew, a trayful of quick lime will be found to absorb the moisture and render the air pure, but of course it is necessary to renew the lime from time to time as it becomes fully slaked.

This last remedy will be found useful in safes and strong-rooms, the damp air of which acts frequently most injuriously on the valuable deeds and documents which they contain.

THE

SANITARY RECORD.

SATURDAY, SEPTEMBER 4, 1875.

THE SALARIES OF IRISH HEALTH OFFICERS.

In the SANITARY RECORD of April 17 we called attention to the working of the Irish Public Health Act, and pointed out the various ways in which the Act had failed, and the causes of its failure. This was five months ago. The medical profession in Ireland has protested, by deputation from its colleges and by resolutions passed at meetings of the Irish Medical and Poor Law Medical Officers' Associations, against the wretched remuneration offered to the dispensing medical officers for their services as sanitary officers. The Irish Local Government Board has taken no notice whatever of these protests. The member for Drogheda, Dr. O'Leary, has, as a last resource before resorting to more energetic means of agitation, brought the question before Parliament at the very end of the session. We regret extremely that Dr. O'Leary had to wait so long before bringing the matter forward; but we believe Dr. O'Leary and his friends delayed action thinking that the Irish Local Government Board might be true to its old traditions and act fairly towards the members of the public health and poor law medical service of Ireland. Dr. O'Leary's protest has met with only a polite rebuff at the hands of the Solicitor-General for Ireland. Dr. O'Leary has made a good case, and proved beyond a doubt that the salaries of the medical sanitary officers are insufficient, or, to use the words of a recently passed resolution at a meeting of medical men in Dublin, 'totally inadequate.' We cannot conceive upon what principle the Local Government Board laid down that the salaries of consulting sanitary officers should be one-third, and of sanitary officers one-fourth, of the salaries paid for their services under the poor law. As poor law medical officers the salaries are, in many instances, quite insufficient, and the payments awarded under the Vaccination and Registration Acts merely nominal for the important services rendered. The average salary of a dispensary medical officer in Ireland is 100*l.* per annum, so that, even if the intentions of the Local Government Board had been carried out, the average salary for his sanitary services would have been only 25*l.* per annum; but even this small pittance has not been awarded, as is shown by our tables of appointments and salaries published in the SANITARY RECORD during the months of November, December, and January last. There does not seem to be any good reason why the salaries for sanitary work should be regulated by

those paid for a different kind of work. The dispensary medical officer as such has only charge of the sick poor, but the sanitary officer has charge of rich and poor alike, whether sick or well, so that his sanitary duties deal with much larger and more extensive interests. In towns his sanitary duties will even exceed his duties as medical attendant on the poor. In replying to Dr. O'Leary, the Solicitor-General for Ireland (whom it may be remembered is member for the University of Dublin, and has therefore a large number of medical constituents) stated that 'so far as they had been able to form a judgment of the working of the Act they were of the opinion that it had worked exceedingly well and was doing a great deal of good.' Our answer to this is simply that the Irish Local Government Board has *not* 'been able to form a judgment' of any value. A board which thinks that a medical man is sufficiently paid for supervising sanitary arrangements at the rate, in many cases, of one pound per 1,000 inhabitants can scarcely be possessed of the necessary mental capacity for framing a judgment on sanitary results. However, we have the report of the board before us, and the whole of the sanitary work done in Ireland for a month is given in a very full abstract. This return shows a considerable amount of noticing and reporting, but hardly any real work; many places made no return at all to the board's circular. We understand that no attempt whatever has been made to get a report from any district as to its real sanitary condition. Any information obtained and any work done has been through the earnest desire of the medical officers to serve the public in spite of the discouragement of central and obstructions of local authorities. The rest of the Solicitor-General's answer we must characterise as incorrect; he said, 'If the medical officers were not properly remunerated it was not the fault of the Local Government Board, which was most anxious that the local boards should properly remunerate their officers,' and farther, 'that on two or three occasions their salaries had been increased by the Local Government Board, who were, therefore, clearly not to be blamed on that head.' We admit that the salaries 'on two or three occasions' were increased, but so, 'on two or three occasions' which the Solicitor-General did not mention, the salaries were diminished by the order of the Board. In fact, there were a few enlightened local boards willing to pay proper salaries, but the Local Government Board, acting in the teeth of the Act of Parliament and having previously fixed the minimum salaries, could not sanction the payment of a reasonable salary, because it was above the maximum. We should like to know why upon the Solicitor-General for Ireland was imposed the invidious task of apologising for the action of a board with which he has no connection, about whose business he knows nothing, and from whom, if we mistake not, the Solicitor-General materially differs; at least we know he held very liberal and enlightened opinions upon these subjects when the Irish Public Health Bill was before Parliament last year. Where was Sir Michael Hicks Beach, the nominal head of the Local Government Board, when Dr. O'Leary brought this important question before the House? On looking at the correspondence between the Irish Local Government Board and the Treasury, relative to the funds required for the payment of expenses under the Irish Public Health Act, we find that on October 14, 1875, the Local Government Board submitted their proposed scale of salaries to the Treasury, and requested the Treasury to sanction the very moderate expenditure of 17,323*l.* for additional salaries, together with some expenditure for new salaries, which would probably not in all have reached the sum of 20,000*l.* as the annual contribution of the Treasury to Irish sanitary expenditure. The Treasury up to November 11 did not take the trouble to answer the letter, after a roundabout correspondence, in which the Irish Local Government Board, with its president, Sir Michael Hicks Beach, writes a letter to Sir Michael Hicks Beach in another capacity, to ask him to ask the Lord Lieutenant to ask the Treasury if they meant to do anything? The Treasury agreed to the proposal of the Irish Board. On February 5, the secretary of the Treasury writes to 'say they have now confirmed their assent which they had understood to be already given,' and their assent is given not on the grounds that the salaries are just or sufficient remuneration for public services compulsorily imposed upon a body of gentlemen who willingly undertook them on the good faith of the Government, but because 'the proposed scale does not strike my Lords as exorbitant.' We are not surprised that the result is general dissatisfaction, as on reading all the documents published by the Local Government Board of Ireland; it is quite clear to us that neither the Treasury, the Local Government Board or local authorities knew much of the important interests they were dealing with. They one and all completely ignored the experience derived from the working of the English Act, and have now laid substantial foundations for an agitation for the removal of a new and real Irish grievance. The Lord Chief Justice of Ireland recently characterised the Irish Local Government Board as a 'most unfortunate body,' a judgment which, we think his lordship would confirm if he knew the history of fixing the salaries of the Irish sanitary officers.

LOANS TO LOCAL AUTHORITIES.

WE resume this week our remarks on Sir Stafford Northcote's Local Authorities Loans Bill, which appears to have gone through its remaining stages in both Houses without undergoing any material alterations, and is now law.

Provision is to be made for the discharge within the prescribed period of every loan in respect of which securities have been issued; where no period

is prescribed, the period is to be twenty years. The discharge of the loan is to be secured by the local authorities by one or more of the following methods.

1. By the issue of annuity certificates, limited to expire within the prescribed period.

2. By the issue of debentures in such manner as to make it obligatory on the local authorities to pay off an equal sum in each year to prescribed period or of some lesser period.

3. By the annual appropriation of a fixed sum to the discharge of a certain portion of such loan.

4. By the creation of a sinking-fund, where such is prescribed, but not otherwise.

When the discharge of a loan is to be effected by the appropriation of an annual sum, this is to be carried out under regulations which are detailed in the Act with great minuteness.

Various regulations are prescribed with respect to sinking-funds. The following are some of the more important.

1. Such equal annual sums are to be paid into the fund each year as, being accumulated at compound interest at the prescribed or necessary rate per cent. per annum, will, at the expiration of some period not longer than the prescribed period, suffice to discharge the whole of the sum borrowed.

2. The first payment is to be made within one year from the date of the loan.

3. All moneys paid into the sinking-fund, and all accumulations thereof, are to be invested by the local authority in the prescribed manner, or, if no manner is prescribed, in securities, in which trustees are by law, for the time being, authorised to invest, or in debentures, debenture stock, or annuity certificates, issued under the Act, by some other local authority. Any such investments may be from time to time varied; and the dividends are to be invested.

4. A local authority is to apply the sinking fund to the purpose for which it was created, and until the loan is wholly discharged, to no other purpose.

5. Provision is made for the selection of the debentures, etc., which are to be paid off.

6. Any surplus of a sinking fund remaining after the discharge of a loan is to be paid to some other sinking fund of the local authority; or if no such fund exists shall be disposed of as the local authority may, with the sanction of the Local Government Board, think expedient.

Where a sinking fund is created, an annual return is to be made by the local authority to the Local Government Board, in such form as may be prescribed by that board, and verified as required, showing the amount which has been invested or applied for the purpose of such sinking fund during the year preceding the making of such return, and the description of the securities upon which any investment has been invested, and also showing the purposes to which any portion of the sinking fund has been applied during the same period, and the total amount, if any, remaining invested at the close of the year. This return must be prepared within twenty-one days after the expiration of each year.

In case a local authority fails to comply with the provisions of the Act with respect to any sinking fund the Local Government Board may order the payment into the sinking fund of a sum not exceeding double the amount in respect of which default has been made. Such order may be enforced by *mandamus*.

In case of non-payment by a local authority of moneys due on securities under the Act, a remedy may be had by *mandamus*, or by the appointment of a receiver. The smallest aggregate amount, whether in one sum or separate sums, to authorise the appointment of a receiver is 500*l*. Receiver may acquire the power to levy rates.

A holder of securities is exempt from all responsibility with reference to the application of the moneys advanced. Trustees, or other persons authorised or directed to invest any moneys in the debentures or debenture stock of any railway or other company, may, unless the contrary is provided by the instrument authorising or directing such investment, invest such moneys in nominal debentures or nominal debenture stock. A notice of trust is not receivable by a local authority in relation to any security issued by such authority under the Act.

Coupons in respect of any debenture, or stock certificate to bearer, may be issued comprising the interest payable during the whole term of the debenture, etc., or during any less period. At the expiration of any such less period fresh coupons may be issued, or such debenture, etc., may be exchanged for another, with coupons for a further period. The Act contains some other provisions respecting coupons.

Stock certificates to bearer may, under certain regulations, be converted into nominal debenture stock. A trustee of debenture stock is not to hold a stock certificate to bearer unless authorised to do so by his trust.

A very important section deals with loans under official sanction. Any local authority about to raise a loan under the Act may apply to the Local Government Board to authorise the issue of 'securities under official sanction.' Before granting such sanctions the Local Government Board is to require the local authority to produce particulars of its financial condition, and the sanction of the Local Government Board is not to be given unless that board is satisfied with the result of the inquiries made. Securities under official sanction are to be authenticated by official stamp as the Local Government Board may direct. The sanction of the Local Government Board is to be conclusive evidence that the securities to which it relates are in conformity with the Act. The owner of any security issued under official sanc-

tion is to be furnished, in the case of a security charged on a rate, with a statement of the rateable value of the property subject to the rate, and, in case of a security charged on property, with a statement of the estimated value of such property. Also of the relative priority of the loan in respect of which such security is issued, and of the other loans, if any, of the local authority.

The Public Works Loan Commissioners may, under conditions, accept securities under the Act.

Local authorities may re-borrow, in manner provided by the Act, for the purpose of discharging their loans, 'provided that the time for repayment of any money so borrowed shall not be extended beyond the unexpired portion of the term for which the original loan was contracted, unless with the sanction of the Local Government Board, and in no case shall be extended beyond the prescribed period.'

With these observations we conclude our summary of this measure, which, if we mistake not, will turn out to be one of great practical utility, and entitle the Chancellor of the Exchequer to the warmest thanks of all local authorities.

Notes of the Week.

THE Duke of Northumberland will move next session for a Royal Commission to inquire into the working and management of works engaged in smelting, burning, or converting ores and minerals from which noxious gases are given off; to ascertain the effects on animal life and vegetation, and to report on the best means for preventing such injury.

SEWER VENTILATION.

MR. BUCKHAM, C.E., has written to the Home Secretary, urging him to exercise his authority over the Board of Works for the Wandsworth district, to compel them to arrange some system for ventilation of the sewers, as, with the exception of two main roads, the sewers are totally unventilated. The southern low level sewer being sixty feet below the level of Wandsworth district, in foggy weather the houses and water-cisterns are impregnated with sewer gas which emanates from the whole length of the system as far as Deptford. This evil has been of long standing, and is certainly a difficult one to deal effectively with. We believe at one time Messrs. Price and Company volunteered the use of one of their furnaces for the purpose of consuming the gaseous products of sewage. Such an experiment would certainly be worthy of a careful trial.

MORTUARIES.

DR. JOSEPH ROGERS, the Vice-President of the Poor Law Medical Officers' Association, has placed the following notice on the minutes of the proceedings of the Strand District Board of Works.

'That with the view to the more effectually and economically securing the establishment of mortuaries in the different parishes of the metropolis, this board do memorialise the Metropolitan Board of Works, urging that board to apply for powers in the next session of Parliament authorising that body to undertake their erection in such parts of the metropolis as may be considered necessary.'

In view of the great want of mortuaries which exists in London, the legal difficulties which surround the removal of a dead body, and the needless expense which would be entailed on every small parish to erect separate mortuaries, Dr. Rogers's suggestion is a well-timed and sensible one.

'UNHEALTHY AREA' IN ST. GEORGE-IN-THE EAST.

FOLLOWING the example of Holborn and Whitechapel, Dr. Rygate, the medical officer of health of St. George-in-the-East, gave notice at a recent meeting of the vestry of the parish, that at the next meeting he should be in a position to lay before them an official representation of the sanitary defects, as to light, air, ventilation, etc., of 291 houses in the parish, which are at the present time unfit for habitation, and urgently require structural improvement or reconstruction. The medical officer stated that in making his recommendations he had only attempted to point out the most glaring instances of sanitary defects. One or two of the vestrymen expressed some dissatisfaction that the Sanitary Committee had not been consulted as to this 'gigantic scheme,' and appeared surprised at the independent power which the Artisans' Dwellings Act confers on medical officers of health. It was resolved that each member of the vestry should be at once provided with a copy of the Act, and that their medical officer of health's report should be considered by the Sanitary Committee.

SEWERING AT OXFORD.

THE drainage works at Oxford, which had been temporarily impeded during the late floods, are now being prosecuted with great vigour. A dam has been put across the Cherwell, the water pumped out, and the excavation beneath the river made ready for the reception of the large iron tubes, surrounded by concrete, which here takes the place of brickwork. The weight of one of these tubes is twenty-six tons. The closing of this part of the river causes a great current in its western branch, the scour of which will doubtless purify and cleanse its bed. No. 5 contract has also been commenced by Mr. Acock, of Norwich, who had the first large contract, which will comprise the whole of the remaining works of sewerage and surface-drainage within the city. The works, when completed, will, it is stated, render Oxford one of the most perfectly drained towns in the kingdom, the system adopted is the best extant, and has received the approval of the most eminent engineers of the day. The scheme now being executed was designed by Mr. W. H. White, engineer to the Local Board, under whose direction and superintendence it is being executed. The contractor is Mr. Dickinson.

PATENT MEDICINES.

THE President of the Pharmaceutical Conference, Mr. T. B. Groves, F.C.S., made some strong but well-timed remarks recently at the annual meeting of the Pharmaceutists. Reverting to the duty of the Government to inquire into and deal with the question of patent medicines and nostrums, he said, 'A Commission to do this would grapple at once with that monster evil, the unrestricted sale of so-called patent medicines. Their composition should be divulged to the commission, and some control exercised upon the publication of advertisements respecting them. It would not, of course, do to license puffs of any kind, but the power of preventing the more scandalous and destructive of the lies from being obtruded on one's attention from every hoarding and almost every publication should be vested in some one. Care for the public health demands some interference; for example, with the sale of certain hair restorers, which, vaunted as not being dyes and uninjurious, are found when chemically examined to contain poisonous combinations of lead. Indeed, there is scarcely a chemist or a doctor who could not adduce from his own experience instances of their poisonous action on the persons of their customers or patients.'

SANITARY DEFECTS AT SOUTH CAVE, NEAR BEVERLEY.

SINCE the beginning of this year an excessively high death-rate has prevailed at South Cave and in several of the neighbouring parishes, which form part of the Beverley rural sanitary authority. In the registration sub-district of South Cave, with a population of rather less than three and a half thousand persons, forty-nine deaths were registered in the first half of this year, which was equal to an annual rate of 28 per 1,000 persons living; and fifteen, or more than 30 per cent. of the deaths, were referred to the principal zymotic diseases, scarlet fever and diphtheria being fatally prevalent. A special meeting of the above-mentioned rural sanitary authority was recently held to receive the report of an inspection of the parish which had been made by the chairman of the authority, the medical officer of health, and several members and officers of the parochial committee. The drainage was found very defective, and the water-supply was conspicuous by its absence; a large number of the inhabitants are driven to use the water of the village beck, which receives the drainage of many dwellings and of a slaughter-house. It is satisfactory to hear that the authority came to the conclusion that it was indispensable that 'the sewage and the water-supply should be separated;' that a better supply of pump-water should be provided; and that the beck should be cleansed. The discussion as to the system of drainage to be adopted was not so satisfactory; it was proposed to cut off all communication of drains with the beck, but to 'leave the occupiers of the houses to make cesspools behind their premises.' It is hoped that the danger to be feared from such a system, in combination with a water-supply derived from wells, will deter the Beverley rural sanitary authority from carrying this proposal into execution.

LEAD-POISONING.

AN inquest held on Monday last, on the body of a woman who lived in Bell Court, Brook Street, Holborn, revealed the fact that the deceased died from the effects of lead-poisoning, the symptoms before death having been fully apparent. From the evidence, it appears that the poor woman worked for a few days, about a month since, at a white-lead factory, and there is no doubt that during that time she imbibed the poison, which, acting on a system predisposed to disease, ultimately caused her death. The verdict was, 'Death from congestion of the brain and disease of the chest-organs, accelerated by white-lead poisoning. In this instance Dr. Hardwicke, the coroner, made a few sensible remarks, which workers in lead factories would do well to act upon. He said that, 'notwithstanding the dangers appertaining to working in a white-lead factory, the persons so engaged could, by careful living and cleanliness, materially assist to counteract the evil effects of the poisonous substance they dealt with, and he would advise all so engaged to drink sulphuric acid diluted, which would counteract the action of the poison.' These precautions are not very difficult to observe in themselves; though we question whether a workman could readily obtain a dilute sulphuric-acid drink, even if he felt disposed. It would not be impracticable, or expensive, however, for the masters to have such a beverage prepared for the use of their hands. The owners of such factories have a great moral and tangible power over their *employés*, which they could beneficially exercise by enforcing the observance of some hygienic rules, such as, one bath, hot or cold, weekly, and by providing ample lavatory convenience on their own premises, with directions that they shall be used by the hands employed. In such cases reforms must and should be initiated from above. It is folly to advise the men and let the masters off with impunity. It is obviously the bounden duty of those who are engaged in any dangerous or injurious trade, to take every possible precaution to insure the health and safety of their servants.

CHARMING BUT STINKING.

IT is a very unromantic question to ask on selecting country head-quarters, How about the scavenging? but it is a very necessary one, and it is not always safe to trust even the olfactory organs for the answer. At this time of the year visitors crowd into Devon from all parts of England, and an honest declaration of the freedom from infectious disease of the chief places of interest is of great importance. Mr. Winter Blyth, medical officer of health of Okehampton Union, in a report to his sanitary authority, observes: 'The Union of Okehampton abounds with picturesque spots, but Chagford is certainly one of the principal attractions. I am glad to say that this little place is perfectly free from infectious disease, is extremely healthy, and in a cleanly state. The only other spot much frequented by strangers in the united district is Clovelly. It is at once the most charming and stinking spot in North Devon. The inhabitants for years have thrown their refuse in every available place outside their doors, so that sensitive visitors, after a few days' residence, have been glad to escape from the offensive odours of decayed fish and vegetables. All this, I am pleased to say, will now be a thing of the past. The Bideford Rural Sanitary Authority have advertised for a scavenger, and I trust soon to be able to say that the most romantic spot in the whole of Devon is as well cared for as Chagford.'

INJURIOUS COSMETICS.

DR. GEORGE JOHNSON, of King's College, has just reported on several cases of lead-poisoning which have come under his notice, and which should have the effect of making the general public cautious in the use of cosmetics, and still more careful in ascertaining their composition. It appeared that a patient was admitted into the hospital suffering from all the symptoms of lead-poisoning. On inquiry it was found that the patient was occupied as a ballet dancer, and it was usual to use flake white freely as a cosmetic. This powder proved on analysis to be composed chiefly of carbonate of lead. This powder applied to the skin of the face becomes partly absorbed through the mouth and nostrils, and thus enters the circulation and pervades the whole system. The patient remarked that she has a friend who suffers from the same symptoms as herself. There is, unfortunately, nothing unusual in this case, as symptoms of lead poisoning have often been traced to the use of cosmetics and also to the habitual employment of hair dyes containing lead.

Dr. Johnson points out another source of lead-poison in a fabric known as American overland cloth. This material is made from canvass coated over with a white glazed coating coloured black. The white coating was found to be composed of a mixture of chalk and carbonate of lead. The workmen employed in manipulating this material absorbed the dust given off from this material, hence the lead poisoning which ensued.

OFFICIAL INQUIRY INTO TOWN SEWAGE UTILISATION.

IT appears that Mr. C. S. Read, M.P., Mr. Robert Rawlinson, C.B., and Mr. S. C. Smith, C.E., who were recently appointed by the President of the Local Government Board to personally inspect and to inquire into the various methods of town sewering, town drainage, and especially of sewage disposal, have completed their inspection of the drainage and sewage systems in use in Edinburgh, Glasgow, Kendal, Birmingham, Wolverhampton, Rugby, Warwick, Leamington, Doncaster, Bedford, Banbury, and Tunbridge Wells. The same gentlemen, it is now stated, will proceed at once to visit certain towns on the continent with a view to similar inspections. In Holland, the pneumatic system of sewage will be studied in Leyden and in other towns. The sewage works and drainage systems at Berlin, Dantzic, Frankfort-on-the

Main, Brussels and Paris are also to be inspected. It is said to be intended that the result of these inspections, both at home and abroad, is to be laid before the President in the form of a report, in order that Government may, next session, be in possession of the most recent, and at the same time independent information as to most of the various methods that have, during the past few years, been adopted in different places for the treatment of sewage, whether mechanically, chemically, or for agricultural purposes. As the question of the pollution of rivers can scarcely fail to come to the front again next session, the information which is now being collected will not only be useful to the Government, but will assist the public to judge of the value of any legislation on the subject which may be proposed.

FEVER NEAR WORTH.

WE have received a copy of a correspondence which has recently passed between a gentleman and the Local Government Board respecting the occurrence of several cases of typhoid fever and scarlet fever at Turner's Hill, Worth, in Sussex, and which, in the opinion of Mr. R. W. Buckley, the gentleman referred to, were due to the use of polluted water. Mr. Buckley being convinced, 'notwithstanding the opinion of the local authority that it is fair drinking water,' that the use of the water did occasion the disease, wrote to the Local Government Board requesting them to order an independent analysis. This request the Board could not undertake to comply with, but they informed Mr. Buckley that they would communicate with the rural sanitary authority on the subject of his complaint. Mr. Buckley, under these circumstances, sent samples of water from the suspected wells to Dr. Hassall, and as far as we can gather from the correspondence, the medical officer of health for the district also examined the water. One sample Dr. Hassall found to be of very great purity, the remainder were of inferior quality and contained some deleterious ingredients which, in some instances, were evidently due to animal matter or sewage. On the other hand the medical officer of health is reported as having examined the water, and having discovered no exceptional impurity.

We cannot decide between the two chemical analyses, neither can we determine whether the water was a cause of disease or not, although it is quite possible that it was so as far as typhoid fever is concerned, and it is most improbable that it had anything to do with the cases of scarlet fever. Indeed, we presume that the main object for which the correspondence has been forwarded to us, is to point out that it is desirable that the Local Government Board should itself undertake the analysis of such waters as those referred to. If we are correct in this surmise, we can hardly agree with Mr. Buckley. At present the Local Government Board does not undertake such analyses, except in so far as they are necessary for the purposes of the reports of their inspectors, and we can quite understand that the establishment of a laboratory for such a purpose might be open to certain objections. Its principal result would probably be that sanitary authorities would, even more than they do now, neglect to deal locally with such sources of disease, as polluted wells, and instead of furthering the system of localisation, which in many respects has great advantages, it would tend to centralisation on points of detail which ought to be examined into and dealt with locally and without delay.

SANITARY WORK IN SUSSEX.

A FEW weeks ago we alluded to the unsanitary condition of some of the towns and villages situated upon the Forest Ridge in Sussex, and we pointed out that although the natural features of the county afforded capital opportunities for drainage, yet in the majority of these places the sewage was disposed of in a very objectionable manner.

The natural healthiness of the district in a great measure counteracts these unfavourable conditions, but lately there has been a great deal of low fever in this part of the country, and when twenty-one cases of typhoid occur consecutively in one small village (Turner's Hill) where the cesspools are horribly near the wells, it is only natural to infer that the arrangements for drainage are in some way deficient.

However, the fact that sanitary improvements are required in this district seems now to be recognised by the inhabitants, who have taken steps to introduce a sound system of drainage into some of the towns.

In two instances we believe that it will not be long before these improvements are carried out.

(1) East Grinstead (population about 2,500), a town where almost all the sewage passes into cesspools formed in the sandstone rock, through which it readily percolates into the wells.

Most of the wells are in a very foul condition, and that one which supplied the town pump was so bad that the guardians lately found it necessary to have it closed.

A few weeks ago the sanitary committee advertised for schemes of drainage, and sixteen different engineers sent in their plans.

The committee unanimously adopted those of a firm of sanitary engineers at Hertford, whose scheme (upon the separate system) provides for carrying the sewage more than a mile away from the town, on to a piece of land belonging to a private individual who has readily consented to receive and utilise the whole of the product upon his land, and so relieve the guardians from the trouble of managing a farm.

Although there are good falls in all directions from East Grinstead, yet the extreme irregularity of the ground offered many engineering difficulties; but, judging from the plans selected, these seem to have been thoroughly mastered, and we have no doubt that before long we shall find this town in a far more healthy condition than it is at present.

(2) Crawley (population about 1,400) is situated at one extremity and below the Forest Ridge. It is built upon very flat land, which renders efficient drainage somewhat difficult. But the engineers, whose scheme has just been selected, seem to provide against this difficulty by their arrangement for storing water for frequent flushing. The thorough emptying of the drains by this means is facilitated by the employment of small pipes (we believe nine-inch diameter). The sewage will be conveyed on to about six acres of land, more than half a mile away from the town, the owner of which has intimated his entire approval of the scheme.

INTERMITTENT WATER-SUPPLIES TO TOWNS.

ALTHOUGH much has said upon this subject in times past, and although Dr. Alfred Carpenter and others have recently rendered valuable service in respect of it, still very much more remains to be said and done before the public will be content. Unfortunately the rule in this country is, to wait for the advent of some terrible calamity, and then to devise means for preventing a recurrence of the evil. The good old maxim that 'Prevention is better than cure,' has seldom any weight with 'the proper authorities,' and nothing but bitter and disastrous experience teaches them lessons of wisdom. In presence of an outburst of fever or cholera, for example, and when under the influence of panic they generally revert to a consideration of the quality and the quantity of the water supplied to dwelling houses, and its effect upon the people who occupy them.

Science, hand in hand, as it always is, with common sense, dictates, on the contrary, that the proper time for improving and rendering efficient the water-supply of a town is, when it is freest from epidemic disease, and when the minds of those who govern its affairs are undisturbed by unreasoning fears or a craven apprehension as to their own safety. Such a time is happily the present. We would, however, most earnestly call upon the urban and suburban authorities of every district, literally to 'set their

houses in order' as regards water-supply. A deficiency of water and an intermittent distribution of it are the sources of worse evils to a community than a limited extent of impurity in its composition would be. It is not so much of the wealthy classes that we are speaking, although indirectly they are concerned in our remarks, as of the people at large, or as they are sometimes styled 'the million.' These latter are chained as it were to particular localities, and must take their houses as they do their wives, for better for worse. There are at the East end of London, for instance, hundreds of thousands of men whose wages average from fifteen shillings to a guinea per week, and who, with their families, are huddled together in a manner alike repulsive to decency and destructive of morals and health.

Many of the miserable tenements thus appropriated have no individual water-supply at all. When they were built, or thrown together, as many of them appear to have been, the cost of laying down pipes was the obstacle to the performance of that operation. True afterwards to what they deem 'commercial principles,' the water companies endeavour to cast the burden on the landlord, who in turn tries to shift responsibility upon the tenant, who does not see the expediency of spending money to benefit other people's property. Thus the water is not laid on at all, and fever or some other contagious disease is necessarily called into existence.

When, as in cases just instanced, and there are thousands of others within a two miles radius eastward and northward of the Bank of England, water is not brought to the houses, all sorts of additional abominations crop up. Refuse of all kinds remains unremoved, and it accumulates in and around the wretched dwellings, in the courts, back yards, cesspools, cellars, and gutters. It requires a vivid imagination to realise the consequences of all this, and little do the rich or the well-to-do know of the state of their poor neighbours, from whose filth, misery, and despair they may some times be separated only by a single street, or even a party-wall.

In many of the populous neighbourhoods of the eastern division of the metropolis it is common to find perhaps eighteen or twenty houses, so-called, built round a wharf. The latter is furnished with one water-cock, from which water flows daily for an hour or two. Those of the neighbouring residents who are fortunate enough to possess a vessel of some kind—and the writer of this article has seen very remarkable ones used for the purpose—get it filled and carry it home! Those who are less fortunate have to make shift as they may, and must wait for the 'troubling of the waters' on the next occasion of their intermittent distribution. Who shall describe the current and contingent horrors of this state of affairs? The first effect of it is to induce to an economising of the scanty quantum of nature's beverage doled out.

Dr. Toynbee, many years ago, wrote of the sad effects of this last-named operation. In fact, water is used over and over again, for a variety of purposes, children are left dirty, vegetables are cooked without being washed, and the condition of inmates and houses alike becomes filthy and repulsive in the extreme.

Is it not right that a knowledge of these things should be forced upon those who would not otherwise appear to heed their existence; but who certainly have power to remedy the crying grievance of an intermittent water-supply, and thus save the lives of thousands of their fellow-creatures? The baneful influences arising from an inadequate supply of water is a theme upon which more—much more—might be said, but it is hoped that the earnestness with which we have spoken out may have due effect, and certainly agitation of the question involved ought not to cease until every tenement in every town in the kingdom has a pipe of wholesome water continuously laid on, so as to effect the moral and physical welfare of its occupants and save the country from disgrace.

Medical Officer's Report.

FILTH DISEASES.

IN his recent report on 'Filth Diseases,' Mr. Simon, Medical Officer of the Privy Council, gives the following terrible account of the condition of matters in many parts of the country. He writes, 'There are houses, there are groups of houses, there are whole villages, there are considerable sections of towns, there are even entire and not small towns, where general slovenliness in everything which relates to the removal of refuse-matter, slovenliness which in very many cases amounts to utter bestiality of neglect, is the local habit; where within, or just outside each house, or in spaces common to many houses, lies for an indefinite time, undergoing fœtid decomposition, more or less of the putrefiable refuse which house-life, and some sorts of trade-life, produce; excrement of man and brute, and garbage of all sorts, and ponded slop-waters, sometimes lying bare on the common surface; sometimes unintentionally stored out of sight and recollection in drains or sewers which cannot carry them away; sometimes held in receptacles specially provided to favour accumulation, as privy-pits and other cesspools for excrement and slop-water, and so-called dust-bins receiving kitchen refuse and other filth. And with this state of things, be it on large or on small scale, two chief sorts of danger to life arise; one, that volatile effluvia from the refuse pollute the surrounding air and everything which it contains; the other, that the liquid parts of the refuse pass by soakage or leakage into the surrounding soil, to mingle there of course in whatever water the soil yields, and in certain cases thus to occasion the deadliest pollution of wells and springs. To a really immense extent, to an extent, indeed, which persons unpractised in sanitary inspection could scarcely find themselves able to imagine, dangers of these two sorts are prevailing throughout the length and breadth of this country, not only in their slighter degrees, but in degrees which are gross and scandalous, and very often, I repeat, truly bestial. And I state all this in unequivocal language, because I feel that, if the new sanitary organisation of the country is to fulfil its purpose, the administrators, local and central, must begin by fully recognising the real state of the case, and with consciousness that in many instances they will have to introduce for the first time, as into savage life, the rudiments of sanitary civilisation.'

Such is the language which Mr. Simon feels called upon to use in describing a largely existing state of things among us after thirty years' sanitary legislation and work. The new sanitary authorities must begin their duties, if they are to be satisfactorily fulfilled, by recognising that in not a few instances they have to introduce the rudiments of common cleanliness among communities. Until this be done, the later knowledge we possess of filth operating at a distance can hardly be effectually inculcated or acted upon. Of this distant operation, brought about by imperfect arrangements for sewerage and water-supply, Mr. Simon next gives a brief description. 'For instance, houses which have unguarded drainage, communication with cesspools or sewers, may receive through such communication the same filth-infections as if excrement stood rotting within their walls; and public or private water-reservoirs or water-conduits, giving accidental admission to filth, will carry the infection of the filth whithersoever the outflow reaches.'

THE Vestry of St. Pancras have already taken active steps with a view of bringing the Artisans' Dwellings Act into operation. At the meeting on Wednesday last the medical officer of health was instructed to inquire and report forthwith whether there are any places in the parish which ought to be dealt with. It was satisfactory to know that this proposition was carried unanimously.

The Health of Watering Places.

XII.—LLANDUDNO.

IN the Registrar General's Watering-place Table the figures relating to the registration sub-district of Creuddyn are taken to represent those for the watering place known as Llandudno. The medical officer of health, and other of the Llandudno local authorities, have frequently pointed out how very considerably the constitution of this sub-district differs from that of the Improvement District of Llandudno, and it has been asserted that the sanitary reputation of the watering place has suffered from the inclusion in the Registrar General's figures of the considerable rural portion of the sub-district. Before attempting to discuss the most correct figures that can be obtained for Llandudno proper, it will be useful, therefore, to describe the constitution of the sub-district. The area of the sub-district of Creuddyn is 24,867 acres, including about 3,000 acres of water; its population in 1871 was 8,779 persons, of whom only 3,082 resided in the parish of Llandudno, which has an area of 2,729 acres, including water. The boundaries of the town of Llandudno, as defined by the improvement district, only include a part of the parish of Llandudno, having a population of 2,762 persons in 1871. It follows, therefore, that the statistics relating to these 2,762 inhabitants are swamped in those for the sub-district with its population of 8,779, as publfshed by the Registrar General. It is generally admitted, however, that the limits of the Improvement District no longer correctly represent the boundaries of the town of Llandudno, which have extended beyond the limits originally fixed. The census report for 1871 shows the population to have rapidly increased during the ten years 1861–71 in the parish of Eglwysrhos and the township of Eirias, as well as in Llandudno parish; and this increase is attributed to the enlargement of Llandudno as a watering place. In the death register the name of the parish is always inserted in the column for the place of death, whereas there is no means of there distinguishing the deaths which occur in those portions of Llandudno parish, for instance, which are situated inside and outside the boundaries of the town. It is necessary, therefore, to deal with entire parishes, and after due consideration it appeared desirable, in our endeavour to judge of the sanitary condition of Llandudno by its mortality statistics of 1874, to accept the figures for the entire parishes of Llandudno and Eglwysrhos, as most nearly representing Llandudno as a watering place. In so doing it is unavoidable that the figures relating to the still rural portions of those two parishes should be merged with Llandudno, and also that a part of the watering place which has extended into Eirias township (a portion of the ancient parish of Llandrilloynrhos) should be excluded. Llandudno, as a watering place, may now be said to be without fixed boundaries, and in this dilemma it is evident that the figures for the two parishes above mentioned will more fairly represent the place than those for the entire sub-district, or for the Improvement District alone.

In the cases of other English watering places, previously discussed in these columns, it has almost invariably been found that the inclusion by the Registrar General of a rural area and population in the registration sub-districts taken to represent the watering place, had the effect of under-stating the death-rate for 1874. Llandudno forms a remarkable exception to this rule. The town of Llandudno during 1874, judged by its death-rate, was healthier than the rural portions of Creuddyn sub-district. The death-rate in the entire sub-district was equal to 20·1 per 1,000; in the two parishes of Llandudno and Eglwysrhos it was 17·1, and in the five outlying or rural parishes it was so high as 23·0. So with the death-rate from the seven principal zymotic diseases, which averaged 2·3 per 1,000 in the entire sub-district, was only 1·4 in the two parishes taken to represent the watering place, and was 3·2 in the remaining or rural parishes of the sub-district. We have no means for ascertaining whether this high death-rate among the rural parishes around Llandudno in 1874 was exceptional. This is a matter for local investigation, but these figures are valuable in proving that, at any rate during that year, the sanitary condition of Llandudno could not be fairly estimated from the consideration of the figures for the entire sub-district, as published by the Registrar General. In 1874 the health of Llandudno was far more satisfactory than that of the surrounding rural parishes.

The growth of Llandudno in recent years has been remarkable, even for a watering place. In 1801 the population of the two parishes we have selected to represent this town did not exceed 587 persons, which had increased in 1851 to 1,860. The proportion of increase in each of the five decades of these fifty years averaged 27 per cent. In 1861 the enumerated population had become 3,148, exceeding by 67 per cent. that in 1851. During the next decade the percentage of increase declined again to 28, but the population of the two parishes in 1871 had become 4,043. In want of a more reliable basis for estimate, it may be assumed that the rate of increase since 1871 has been the same as prevailed between 1861 and 1871, in which case the population of the two parishes in the middle of 1874 may be estimated at 4,386, and in the middle of this year at 4,497. It may here be stated that the population of the five rural parishes was stationary between 1861 and 1871, and probably still continues stationary.

Although we have obtained the correct mortality statistics for the two above-mentioned parishes in 1874, we shall be dependent upon the figures relating to the entire sub-district in recent years for the purpose of comparison. The annual birth-rate in the Creuddyn sub-district averaged 32·2 per 1,000 during the ten years 1861-70; in the four years 1871-4 it was successively 29·3, 29·5, 26·8, and 31·4. Thus the birth-rate has averaged but 29·3 per 1,000 during the past four years, and has been 2·9 below the average rate in the preceding ten years. This decline in the birth-rate suggests the possibility that the present population of Llandudno is somewhat over-estimated, in other words that its inhabitants have not increased since 1871 at the same rate which prevailed during the decade 1861-71, in which case the birth and death-rates in recent years are slightly understated. This decline in the birth-rate may, at any rate, be taken as evidence that the present population of the town is not understated or the death-rate calculated thereon overstated.

During the ten years 1861-70 the annual rate of mortality from all causes in Creuddyn sub-district averaged 19·2 per 1,000. It should here be stated that the union workhouse of Conway is situated in Conway registration sub-district, and the deaths of any Llandudno paupers that may there occur should be brought into account in calculating the death-rate of the watering place. As, however, only six deaths were recorded during 1874 in the union workhouse, of which probably but one or two were of paupers admitted from Llandudno, we have been content to omit making any correction on this account, which, without a special return from the workhouse showing the settlement of each of the deceased paupers, could not be correctly carried out. Local medical officers of health should, however, always be furnished with such a return relating to deaths in workhouses, in order that this correction may be made. In the four years, 1871–4, the annual death-rate in the sub-district, also uncorrected for workhouse deaths, was 20·8, 18·1, 16·9, and 20·1 respectively; the death-rate in these four years averaged 19·0 per 1,000, and was thus slightly below the average rate in the ten preceding years. It appears probable, judging from the results of a careful examination of the death-register in 1874, that in recent years the health of Llandudno proper has improved, whereas that of the outlying rural parishes has deteriorated.

How far this surmise is supported by facts could only be determined by a critical examination of the death-register in recent years, such as we have attempted for 1874.

We will now proceed to discuss the details of the seventy-five deaths registered in the two parishes of Llandudno and Eglwysrhos during the year 1874, which was, as before stated, equal to a rate of 17·1 per 1,000 of the estimated population. They included four which were referred to diphtheria, one to scarlet fever, one to diarrhœa, and not one either to small-pox, measles, whooping-cough or fever; in all, six deaths resulted from these seven principal diseases of the zymotic class, equal to 8·0 per cent. of the deaths from all causes, and a rate of 1·4 per 1,000 persons estimated to be living. In the registration sub-district of Creuddyn the annual death-rate from the diseases in the three years, 1871-73, was successively 2·3, 1·5, and 0·9 per 1,000, whereas it increased again in 1874 to 2·3, as above stated. Among the eleven English watering places, the statistics of which have been previously discussed in detail in these columns, the percentage of deaths from these seven diseases to total deaths in 1874 ranged from 5·6 in Eastbourne, to twenty-eight in Yarmouth; and the death-rate per 1,000 from 0·9 in Eastbourne to 6·4 in Yarmouth. With the single exception of Eastbourne the death-rate from the principal zymotic diseases was lower during 1874 in Llandudno than in any of the eleven watering places alluded to.

With reference to the six deaths in Llandudno, which resulted from the principal zymotic diseases, it may be noted that two fatal cases of diphtheria occurred both in the first and second quarters of the year, of which two occurred in Madoc Street and Back Madoc Street, and two in Mostyn Street and Back Mostyn Street. Diphtheria has during the past four years been far more fatal in Llandudno than any other zymotic disease, and it would, therefore, be instructive to note the localities in which the deaths referred thereto in recent years have occurred. In all probability this information would indicate those parts of the town the sanitary condition of which is least satisfactory. During the three months ending September the death of an infant was referred to diarrhœa, and one of an adult to scarlet fever in Vaughan Street. The only death referred to diarrhœa in Llandudno during 1874 was of an infant in the third or summer quarter of the year; this death was equal to an annual rate of 0·9 per 1,000 during these three months. No death was referred to diarrhœa in Eastbourne during the summer quarter of 1874; while in the other watering places dealt with the annual death-rate from this disease during the same period ranged from 1·2 and 1·3 per 1,000 in Hastings and Weymouth, to 3·5 and 4·9 in Lowestoft and Margate.

Before leaving the subject of deaths from zymotic diseases in Llandudno during 1874, it may be useful to say a word or two as to the mortality from the same causes in the five rural parishes around the watering place, which are also situated within the registration sub-district of Creuddyn. We have already pointed out that whereas the zymotic death-rate in 1874 was but 1·4 per 1,000 in the two parishes taken to represent the watering place, it was equal to 3·2 in the five rural parishes. In other words only six deaths resulted from these causes during the year in Llandudno, against sixteen in the parishes outside the town which have about an equal aggregate population. In Llanelian parish, which has a population of less than 500 persons, two deaths from scarlet fever and one from measles occurred during the year. In Llansaintffraid parish, with a population of little more than a thousand, four fatal cases of measles, two of diphtheria, and one of English cholera were recorded. In the parish of Llandrilloynrhos (including Eirias township) two deaths from measles and one from English cholera occurred. A death was referred to fever in Llangwstennin, and one each to fever and diarrhœa in Llysfaen parish. It is evident that the mortality from zymotic diseases in these rural parishes in 1874, was not only excessive for a rural population, but higher than in many urban populations, including that of Llandudno, where, as we have showed, the mortality from zymotic diseases was satisfactorily low in 1874.

During 1874, within the two parishes of Llandudno and Eglwysrhos, taken to represent Llandudno as a watering place, fourteen deaths were referred to diseases of the respiratory organs, and four to phthisis; these were equal to a rate of 3·2 per 1,000 from the former, and 0·9 from the latter. The death-rate from diseases of the respiratory organs during 1874 was equal to 1·8 in Worthing, 2·4 both in Folkestone and Lowestoft, 2·6 in Eastbourne, 3·1 in Hastings, and 3·6 in Dover; the rate 3·2 from these diseases in Llandudno was therefore higher than that which prevailed in most of the other watering places we have previously dealt with. The phthisis death-rate during 1874, which was so low as 0·9 per 1,000 in Llandudno, was equal to 1·3 in Lowestoft, 1·4 in Folkestone, 1·8 in both Eastbourne and Dover, 2·0 in Worthing, and 2·6 in Hastings. It would be interesting to know whether during a series of years Llandudno would show so low a death-rate from phthisis as in 1874. It is evident that however much the death-rate in Llandudno in 1874 was unfavourably affected by the registration therein of deaths of visitors, very few of these visitors could have died from phthisis. The comparatively high rate from diseases of the respiratory organs may, however, have been to some extent affected by this cause.

Infant mortality, measured by the proportion of deaths under one year of age to births registered, was equal to 98 per 1,000 in 1874, in the two parishes taken to represent Llandudno. In the entire sub-district of Creuddyn, infant mortality, measured in this way, was equal to 116 per 1,000 during 1874, against 143, 88, and 133 in the three preceding years. In the five rural parishes of this sub-district infant mortality was equal to 129 per 1,000, instead of 98 as in Llandudno, thus corroborating the evidence of the unsanitary condition of these parishes afforded by the high death-rate from the principal zymotic diseases. Infant mortality in England during 1874 averaged 151 per 1,000, and in the eleven watering places previously referred to it ranged from 95 in Worthing to 158 in Lowestoft.

The enumerated population of Creuddyn sub-district in 1871 contained a proportion of 96·5 per 1,000 of persons aged sixty years and upwards; this proportion is considerably higher than that in most of the other watering places we have noted. Assuming that the proportion of persons aged sixty years and upwards in Llandudno has continued the same as it was in 1871, it may be estimated that 423 persons of these ages were living in the middle of the year 1874, in the two parishes taken to represent the watering place, and as thirty deaths of persons aged upwards of sixty years were there registered during the year, the death-rate was equal to 70·9 per 1,000. In the whole of England and Wales the death-rate among persons of these ages in 1874 was 72·0 per 1,000, whereas among the eleven watering places it ranged from 56·4 in Weymouth to 67·2 in Worthing. The cause of the high death-rate among elderly persons in Llandudno during last year, when considered with reference to the low rate among infants, children, and young adults, appears to require explanation. Do the deaths of visitors which the medical officer of health (Dr. Nicol) has stated form so large a proportion of deaths in Llandudno consist principally of elderly invalids? It is worthy of note that ten of the thirty deaths of persons above sixty years of age in Llandudno during 1874 were referred to diseases of the respiratory organs, including five to bronchitis and three to asthma.

This examination of the recent mortality statistics of Llandudno would not be complete without some reference to the figures of the first half of this year published in the Registrar General's first two quarterly returns for 1875. During the six months ending June 30 last, 105 deaths were registered in Creuddyn sub-district, exceeding by twenty-two the average number in the corresponding quarter of the three years 1872-3-4. This excess was in Llandudno, as well as in other parts of the country, princi-

pally due to the exceptional fatality among elderly persons. The deaths of persons aged upwards of sixty years in the sub-district which had been but twenty-nine, twenty-four, and twenty-eight in the first halves of the three years 1872-3-4, were thirty-eight in the six months ending June last. The annual death-rate from all causes was equal to 23·1 per 1,000 in the six months. To the seven principal zymotic diseases nine deaths were referred in the six months, of which one each of scarlet fever, diphtheria, and fever occurred in the first quarter, and two each of whooping-cough, fever, and diarrhœa in the three months ending June. The annual death-rate from these seven diseases in the six months was equal to 2·0 per 1,000. We are not at present aware of the exact localities in which the deaths from zymotic diseases since the beginning of the year have occurred. Dr. Nicol, however, showed in the return, with which he favoured us a week or two since, that no death from any zymotic disease occurred in Llandudno during the three months ending June, and as six were returned in the sub-district it may be assumed that the health of the rural parishes around Llandudno continues to compare unfavourably with that of the watering place itself.

It would be impossible from the foregoing examination of the recent vital statistics of Llandudno to draw anything but favourable conclusions as to the present sanitary condition of this watering place. With the exception of a slightly fatal prevalence of diphtheria in the early part of the year, Llandudno was remarkably free from diseases of a zymotic character during 1874, and this comparative immunity from these diseases has continued since the beginning of this year. The death-rate from all causes has recently been low and has showed a steady decline. Infant mortality, moreover, has been considerably below the average, and, perhaps, the only unfavourable feature of the returns is the comparatively high death-rate among elderly persons. There is every reason to hope and expect that, upon the completion of the new and improved system of drainage, which has been projected with a liberality and energy that affords the best proof of the earnestness of the local authorities in sanitary matters, the health of Llandudno will continue to improve. We should be glad to hear that the urban sanitary authority had provided itself with a small hospital for the isolation and treatment of infectious diseases; a watering place neglecting such accommodation might almost as well remain unprovided with fire-engines, and trust to the chance of escaping without an occasional fire. Zymotic disease may at any moment be imported into a watering place, and, without the means for isolation, a single case may produce an epidemic. The expense of such a hospital, moreover, is small compared with that of an epidemic. In the interests, moreover, of Llandudno, it appears very desirable that some arrangement should be made by which the rural parishes round Llandudno could be placed under the same sanitary organisation as the watering place. The Union of Conway, for instance, could be advantageously formed into a combined urban and rural district. The sanitary condition of the five rural parishes of Creuddyn sub-district appears to call for urgent attention; and, as it may become at any time a source of danger to the health of Llandudno, the local authorities of this town have a right to demand its investigation and improvement. Neither can it be to the interest of the rural parishes to ignore or imperil the welfare of the watering place.

In leaving the southern coast of England and crossing to Llandudno, we make a considerable leap in space, as well as in climate. We come to a country very different from the cultivated lands of the south, and one that is less prosaic, and appeals more to the imagination. Wales is full of picturesquely situated sea-bathing places. Before the beginning of this century some of these were well-known, for instance Swansea and Tenby on the southern coast, and Aberystwyth on the west, all very attractive places. But there are many newer places which owe their origin mainly to the expansion of Liverpool and of Manchester, and to the desire of the inhabitants of those places to have health resorts for their families within easy reach.

Of those more modern places Llandudno is the queen, being far the most fashionable and gay place along the coast. It has been built within the last twenty years in showy rows of houses and in terraces, which run along the curve of the bay, which extends from the Great to the Little Orme's Head. The distant views in all directions are magnificent, the nearer ones are somewhat deficient in vegetation. The sands are excellent, and as there are two bays on either side of the town, one facing the north-east, the other facing the south-west, there is scarcely a day of the year in which one of the two is not suited for bathing in; and the slope of the sands is so gradual, that people can bathe almost in any state of the tide. There are sea-water baths attached to the new Bath Hotel.

There are steamers frequently coming from and going to Liverpool; there are the usual reading rooms and means of recreation; the whole population is not engaged here as at Aberystwyth in the collection of pebbles (and we were much puzzled at that place on first seeing crowds of people wandering about with their faces intently fixed on the sands), yet the beach at Llandudno supplies a sufficient amount of pebbles to give the lapidaries some employment. There are objects of interest in the neighbourhood to satisfy the most different tastes. The rocky limestone promontory of the Great Orme's Head rises to a height of between two and three hundred feet, and has much grandeur in itself, besides commanding fine panoramic views. The walk round it is one of the most striking in England. The antiquary has the restored chapel of St. Tudno, a cromlech, a rocking-stone, a British fortification with some of the old circular houses to investigate. The botanist may find a considerable quantity of rather rare species of plants, and the geologist will find many fossils. We need not say that the whole country behind is full of fine scenery, and that only three miles off are the frowning ruins of Conway Castle.

The chief drawback to Llandudno is its being overcrowded and expensive, as it is the fashionable resort of the citizens of Liverpool. Llandudno has great advantages of climate, and its meteorology has been carefully studied for a series of years by its indefatigable sanitary officer, Dr. Nicol. Although situated in Wales, where there is a heavy rainfall, it appears to be protected on the south and south-west by mountains which attract the heavy rain-clouds which rise from the Atlantic, and their force is spent before they reach Llandudno. That place has consequently only a rainfall of about thirty inches; a much smaller one than might have been expected, seeing that some stations in Wales, such as Beddgelert, occasionally have a fall of 108 inches. Owing also to the light and porous soil of Llandudno, the humidity of the air is not excessive.

According to Dr. Nicol, in the year 1873 the mean temperature of the first quarter was 42°, of the second 52·6°, of the third 58·8°, and of the fourth 43·4°. Dr. Nicol has also compiled the following comparative table of mean temperatures at Llandudno, Osborne, Isle of Wight, and Brighton, for the same year.

	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Llandudno .	43·4	38·5	44·1	48·0	51·8	57·9	60·7	61·0	54·8	50·0	44·8	45·5
Osborne . .	42·5	35·8	43·7	47·0	51·8	57·7	62·0	62·0	56·4	50·1	45·9	42·8
Bournemouth .	43·6	36·3	42·9	45·9	50·9	56·8	61·4	61·8	55·3	49·3	45·5	42·8
Brighton . .	42·5	35·2	43·2	45·8	50·6	59·0	62·2	62·2	55·3	49·6	45·6	42·4

The results of this year resemble those of former ones, only that the first quarter was unusually cold, and are shortly these: that for the three months of July, August, and September, Llandudno is cooler than any of the other places, and that for all the other months of the year,

including May and June, Llandudno is either warmer or of the same temperature.

The mean daily range of temperature for a series of years was just over 12°, and about 7° for the months of January, February, and March—or very much the same as that of Hastings. Although the number of days on which rain fell at Llandudno during the winter was greater than at Hastings, the mean humidity of that season was somewhat less. West winds usually blow for one half of the year, and the east wind, which blows for sixty days, is tempered by crossing the sea. Llandudno is somewhat exposed to most winds except the north-west.

With reference to its mild and equable winter temperature, it is not surprising that Llandudno has been recommended as a winter resort. The range of daily temperature is less than at many stations on the Riviera.

Law Reports.

STARTLING SEIZURE OF BAD MEAT.

THE Liverpool magistrates have just had occasion to grant an order for the destruction of about thirty tons of bacon. The bacon had been saved from the wrecked steamer 'Abbotsford,' and it was alleged that it was intended to re-ship it to Cuba for consumption by the blacks. It was proved that the bacon was quite unfit for human food, and Watson, Dunn, & Co., to whom it was consigned, at once agreed to have it melted down, and to do the same with the remainder of the consignment, worth altogether about 5,000*l.* originally.

RICED BREAD.

AT the Lambeth Police Court, W. Parnell, baker, has been summoned for selling bread containing rice. A loaf purchased at the defendant's shop was found to contain rice. A witness for the defendant stated that the flour was used as received from the miller's. Mr. Clarke, for the prosecution, relied on the case of 'Fitzpatrick *v.* Kelly,' where a person was convicted of selling for butter an adulterated article at a small sum. Mr. Straight submitted that the case cited was not to the point. It was not intended that a tradesman should be liable for selling an article which he believed to be genuine, but which happened to be adulterated. Mr. Ellison was of opinion that the offence was proved; to hold otherwise would open a wide door to offences. He imposed a fine of 10*s.*

ATMORE'S MINCEMEAT.

IN the case of *Kelsey* v. *Albert*. The plaintiff was a wholesale dealer in meats, and the defendant an architect. In November last the defendant, having obtained an introduction to the plaintiff, called and brought with him a sample of mincemeat. The meat was described as 'Atmore's mincemeat,' a very superior article, ready for immediate use, and was guaranteed to improve every day it was kept. According to the plaintiff, the defendant on this occasion said nothing about his being an agent, but gave out that he had a quantity of the meat to dispose of. The plaintiff bought ten cases of jars and fifty crates of pails, which were duly delivered and paid for to the amount of 70*l.* Shortly afterwards, the plaintiff observed one of his crates in an oozing condition, and upon examination found that a bottle inside had popped its cork. A further examination was made, and it was discovered that in every case there were some bottles which had burst their corks. In the meantime several customers had made complaints and returned what they had bought, and the result was that the plaintiff had only been able to dispose of a very small quantity, and he now brought this action to recover the balance which he had lost, over 60*l.* Verdict for the plaintiff—damages, 40*l.*

SLAUGHTERHOUSE BY-LAWS.

AT Clerkenwell police-court, J. A. Stone, butcher, of Pratt Street, Camden Town, was summoned in respect of an offence under the Slaughterhouses, etc. (Metropolis) Act. Mr. Cooper, solicitor for the prosecution, said that this was the first prosecution that had been instituted under the Act, by which the Metropolitan Board of Works was empowered to draw up some by-laws for regulating the conduct of the business of a slaughterer. It was required that a number of tubs, boxes, or vessels, formed of proper non-absorbent materials, with tight and close-fitting covers, should be provided to carry away all manure, etc., and that the vessels, with their contents, should be removed from the premises within twenty-four hours. Complaint having been made to the sanitary committee, Mr. W. Routh visited the premises, where the blood of a sheep just slaughtered was being allowed to run down a drain. There were none of the vessels which the law required to be supplied; but Mr. Routh had since found that they had been procured. Mr. Hannay ordered the defendant to pay a fine of 40*s.*, and 12*s.* costs.

LONDON SEWER RATES.

BY section 163 of the Metropolis Local Management Act, 1855, sewer rates levied on land used as arable, meadow, or pasture-ground, or as woodland, orchard, market-garden, hop, herb, flower, fruit, or nursery ground, are to be assessed on one-fourth of the net annual value; and other kinds of property are also exempt from sewer rates, or entitled to a reduction. It is the practice of the Metropolitan Board of Works, in issuing to the different parishes its 'precepts' for money to make no allowance in respect of property entitled to exemption or reduction; and those parts of the metropolis in which such property is situated are obliged to increase the sewer rates in order to meet these 'precepts,' to make up for the deficiency in the rate levied upon the exempted lands. The practice has led to considerable confusion and unfairness, and a bill has been introduced into Parliament making it compulsory on overseers and assessment committees under the Valuation (Metropolis) Act, 1869, to cause the totals of the gross and rateable value of the property so relieved to be inserted henceforth in the valuation list, and the 'precepts' of the Metropolitan Board are in future so to be estimated that all parts of London shall be uniformly rated.

BRIEF NOTES OF CASES.

CONTRACT, DISQUALIFICATION BY.

1875. *Tanfield* v. *Reynolds*. 'Education Act, 1870,' sections 20 & 34.—Election.—Members of board interested in a printing contract relating to the board held rightly convicted, though the contract was not made with the board but with the mayor as statutory returning officer. (39 J. P., 293.)

LEGAL PROCEEDINGS.

1875. *Small* v. *Bickley*. 'Nuisances Removal Act, 1863.'—Search for diseased meat.—Held that refusing to admit an inspector was not an offence within the Act, as such refusal did not amount to 'obstructing' an officer. (32 L. T., 726; 39 J. P., 422.)

RATING OF PROPERTY.

1875. *Willings* v. *St. Pancras Vestry*. Assessment of advertisement hoardings.—Question of beneficial occupation. (39 J. P., 155.)

STREET, OBSTRUCTION OF.

1874. *Ball* v. *Ward*. 'Towns Police Clauses Act, 1847,' section 28.—Obstruction of street, owing to persons crowding round a caravan lawfully placed away from the street.—Held that the proprietor ought not to have been convicted. (39 J. P., 407.)

Review.

The Itchin and the Leam: Being Sanitary and Analytical Notes on the Leamington Water-Supply. By HORACE SWETE, M.D., with Remarks by PROFESSOR WANKLYN. Pp. 32.

DR. HORACE SWETE has come forward as a volunteer in defence of the water-supply of Leamington Priors, in consequence, as it appears, of certain comments in the public prints, which had caused 'considerable panic, and consequent injury to the town.'

The report which lies before us is founded on the examination of certain samples of the water above the *intake*, and as supplied in the house taps, and the conclusions at which Dr. Swete and Professor Wanklyn, who was associated with him in some of the analyses, have arrived are so startling, and so apparently contrary to the evidence, that, in justice to themselves, it will be necessary to give it in some detail.

It appears that the water for Leamington is derived partly from wells 'which are contaminated to a marked degree,' but chiefly from the Leam, a sluggish, tortuous stream, which is joined by the Itchen at a short distance above the town. These rivers receive the drainage of several populous villages and isolated farms, which, as Dr. Swete shows, form a constant source of pollution.

The intake is above the town, 'between two weeping willows touching the water, where the water-lilies abound, one of the most attractive spots of the river.' The water from this point passes into a subsidence tank, after which it is filtered and pumped into two reservoirs 'excavated in the hill, lined with brick and arched over,' each of which contains 500,000 gallons.'

The daily use in summer for all purposes is 620,000 gallons; storage, therefore, is out of the question, and Dr. Swete's precautions in taking his samples for analysis last year, 'before the weather became so hot as to induce decomposition of the sediment and consequent production of gases, and whilst there was no decomposition arising from fallen leaves,' seem rather refined. It must be borne in mind that a chain is no stronger than its weakest link, and an examination of the water in July or August would at least have shown it at its worst. Let us see what it was in June. Twelve specimens of water were submitted to analysis and physical examination—five from the Itchen, three from the Leam, one from a town tap, and three of the same after being submitted to extra processes of filtration, etc.

No. 1, taken above the Harbury Lime Works, on the Itchen, was of a pale yellow tint; contained of chlorides, 1·1 per gallon; free ammonia, 0·0; albuminoid ammonia, ·42; as well as other indications of a large amount of organic matter, chiefly vegetable; the total solids were 37 grs. per gallon.

No. 2, taken half a mile below the lime works, showed a solid residue increased to 57·4, and a decrease of albuminoid ammonia, probably due to precipitation, to ·32. Nos. 3, 4, and 5, still from the Itchen, give evidence of very considerable sewage contamination; the colours range through yellow brown, opalescent greenish opaque, and pale green opaque. The solids are increased to 58, the chlorides to 2·0, the free ammonia is ·02, ·02 and ·03, the albuminoid ammonia, ·46, ·28 and ·50. The two last smelt strongly of sewage, which was readily detected under the microscope in the form of epithelium, muscular fibre, etc.

Passing to the Leam, nos. 6 and 7 were taken half a mile above Marton and at Eathorpe—the colours were pale green, and yellow green respectively. Nitrates considerable; chlorides, 1·2 and 1·3; free ammonia, ·00 and ·01; albuminoid ammonia, ·30 and ·26.

We next come to the actual town supply—no. 8 before filtration, no. 9 as drawn from a tap in the town.

The first was yellow-green, nearly transparent, and contained volvox, sporules and diatoms; nitrates moderate; total solids, 49, brown on incineration; chlorides, 1·3; free ammonia, ·00; albuminoid ammonia, ·22.

No. 9, as supplied to the houses, a pale greenish-yellow, transparent; spores sparingly, no diatoms, animal or vegetable tissues; nitrates very moderate; total solids, 43; loss on incineration, 8·5, slightly brown; degree of hardness, 17; chlorides, 1·3; free ammonia, ·00; albuminoid ammonia, 14.

Nos. 10, 11, and 12 show the effects of Clark's process, and of different forms of filters, all of which would be valuable as additions to the present means of purification, if the endeavour now being made to obtain water from the deeper strata by boring should from any cause prove a failure.

Let us briefly recapitulate. Of the nine samples none were colourless, and one only—that from the town tap—could be pronounced transparent. None were free from spores; all but one, and that a foul one, contained nitrates; it would have been more satisfactory if the nitrites had been determined. The total solids vary from 37 to 58, that of the town tap containing 43 grains in the gallon. The chlorides, which are in part derived from the sandstone marls, vary from 1·1 to 2·0; the free ammonia from ·00 to 0·3, and the albuminoid ammonia from ·14 at the tap to ·50 at a point on the Itchin.

Such is the evidence, and the conclusions at which Dr. Swete and Professor Wanklyn have arrived must be given in their own words, for it may be doubted whether they are quite in accordance with one another.

Dr. Swete, after admitting most ingenuously at p. 11 that the water for his own family use is 'boiled for one hour, and filtered through the Silicated Carbon Company's charcoal filter, which is cleaned once every week,' says 'that there is no cause for alarm or anxiety in the condition of the water as supplied by the town authorities, and that I do not consider drinking that water in any way prejudicial to health, although it is capable of considerable improvement.'

Professor Wanklyn goes farther and yet not so far. Proceeding boldly where doctors fear to tread, he says, 'There is no ground for the belief that the water supplied by the authorities would communicate typhoid fever or cholera at times when those diseases are rife.' Far more cautiously, in his own special department, he proceeds, 'From the annexed analysis it appears that the water supplied to Leamington has much the character of that supplied by the Southwark and Vauxhall Company to London, and I most cordially endorse Dr. Swete's assertion that whatever may be the condition of the town water it must be vastly safer than the water from private wells.'

This is indeed damning with faint praise when,

as we have seen, the wells were 'contaminated in a marked degree,' and Professor Wanklyn says in another place, 'Two of the Thames Companies, viz., the Southwark and Vauxhall and the Lambeth Companies, supply impure waters at all seasons, and instead of ·06 milligrammes per litre, supply water yielding on an average about ·14 milligrammes of albuminoid ammonia,'* exactly the amount, it will be observed, of the Leamington tap supply.

Dr. Swete, of course, suggests that the sewage should be kept out of the river—that additional filtration should be employed, and that Clark's process should be tried, but the real remedy for an evil which undoubtedly exists, must be sought in the artesian well which is now in course of formation. One attempt was rendered abortive by the accidental tapping of a mineral spring—but the success obtained at a brewery in the upper part of the town, and the results of the town boring, so far as it has been carried, give every hope that Leamington will some day be supplied with water which needs no defence from chemists, and which is not dependent on oxidation, subsidence, or repeated filtration for the good qualities which it possesses.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

BARSTOW, Mr. J., has been appointed Inspector of Nuisances for the Cardiff Rural Sanitary District, Southern Division, vice Thomas appointed Surveyor and Inspector of Nuisances for the Newtown and Llanllwchaiarn Urban Sanitary District.

BAYLIFFE, Alworth Merewether, M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the No. 4 Sub-District of the Axbridge Rural Sanitary District for two years.

BIDDLE, Mr. George, has been appointed Surveyor to the Bootle-cum-Linacre Urban Sanitary Authority, vice Clemmey, resigned.

COLLINS, Henry William, M.R.C.S. Eng., L.S. A. Lond., has been re-appointed Medical Officer of Health for the No. 2 Sub-District of the Axbridge Rural Sanitary District for two years.

CORBET, David, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Kidderminster Urban Sanitary District for two years.

DINSDALE, Mr. John, has been appointed Surveyor and Inspector of Nuisances for the Whickham Urban Sanitary District.

FORD, Joseph, M.R.C.S. Eng., L.S.A., Lond., has been re-appointed Medical Officer of Health for the No. 3 Sub-District of the Axbridge Rural Sanitary District for two years.

FURNESS, George, Esq., has been appointed Chairman of the Willesden Urban Sanitary Authority.

HAYLOR, Mr. James. has been appointed Collector to the Willesden Urban Sanitary Authority.

ROBSON, Mr. O. Claude, has been appointed Surveyor to the Willesden Urban Sanitary Authority.

TILLEY, Mr. Samuel, has been appointed Clerk to the Willesden Urban Sanitary Authority.

THOMPSON, Mr. R., has been re-appointed Inspector of Nuisances for the Hexham Rural Sanitary District for one year.

WADE, Charles, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the No. 1 Sub-District of the Axbridge Rural Sanitary District for two years.

WILLACY, Mr. John, has been appointed Surveyor to the Weston-super-Mare Urban Sanitary Authority, vice Gaskell, resigned.

WILLIAMS, W. H. Esq., has been appointed Treasurer to the Willesden Urban Sanitary Authority.

WIMPENNY, Jonas, M.R.C.S., Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Upper-Thong Urban Sanitary District for two years.

VACANCIES.

ACCRINGTON URBAN SANITARY AUTHORITY. Clerk. Application, 4th instant, to the Chairman.

CLAY LANE URBAN SANITARY AUTHORITY. Clerk. Application, October 1, to Mr. Mycroft, Clerk *pro tem.*, Clay Cross.

ELY URBAN SANITARY DISTRICT. Surveyor and Inspector of Nuisances.

GOLCAR URBAN SANITARY DISTRICT, combined with several others (usually called the Colne Valley District): Medical Officer of Health. Application, 11th instant, to J. B. Robinson, Chairman, Marsden Urban Sanitary Authority.

KINGSTON-UPON-HULL URBAN SANITARY AUTHORITY. Clerk, Town Clerk, Clerk of the Court of Record, and Steward of the Manor of Myton.

LINTON RURAL SANITARY DISTRICT. Inspector of Nuisances: 80*l.* per. annum. Application, 8th instant, to J. T. Collin, Clerk to the Authority, Saffron Walden.

NETHER-THONG URBAN SANITARY DISTRICT. Surveyor.

REIGATE. Assistant Surveyor to the Corporation and Urban Sanitary Authority: 100*l.* per annum. Application, 14th instant, to C. J. Grece, Town Clerk.

RIPLEY URBAN SANITARY DISTRICT. Surveyor, and Town Surveyor.

TUNSTALL URBAN SANITARY AUTHORITY. Surveyor: 100*l.* per annum. Application, 6th instant, to H. W. Ackrill, Clerk to the Authority.

WANTAGE RURAL SANITARY DISTRICT. Inspector of Nuisances: 100*l.* per annum. Application, 6th instant, to Edward Ormond, Clerk to the Authority.

SANITARY PATENTS.

2620. Improvements in apparatus for preventing waste of water. Samuel Stevens Hellyer, Newcastle Street, Strand, London.

2653. Improvements in the purification of gas. Thomas Howard, Wretten House, Norfolk.

1120. Deodorising and disinfecting water-closets, etc. Michael Henry Brown, New Cross.

1239. Distilling sea-water, etc. Henry Fisher, Grafton Street, Heaton.

1374. Disinfectants. John Howard, Linden Grove, Nunhead Lane, Surrey.

ABSTRACTS OF SPECIFICATIONS.

399. Purifying sewage and collecting grease for the manufacture of gas, and removing incrustation in boilers. G. Rydill, Quality Court, Chancery Lane.

This invention of improvements is for the purification of sewage and polluted waters, preventing the pollution of rivers and streams, which improvements are applicable for collecting the soap, grease, and oils, which prevent insoluble soaps and slimy scum from mixing with the sewage waters in the sewers, which may be used for the manufacture of gas and other useful purposes. As the polluted waters are precipitated with an alkali, such waters after being purified may be used for steam boiler purposes for removing incrustation.

448. Trapping apparatus. R. P. Pope, King's Road, Gray's Inn, London.

According to this invention the trapping is formed of tubular coils, or a chamber to act as such, supplied with water, and caused to revolve.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer—not necessarily for publication.

STATISTICAL RETURNS OF MEDICAL OFFICERS OF HEALTH.

C. P. S.—We have no doubt copies of the forms which were drawn up, about a year since, by the society of Medical Officers of Health with a view to promote uniformity in the statistical portion of reports of medical officers of health, would be forwarded on application to either of the honorary secretaries of the society, Dr. Northcote Vinen, of Southwark, or Dr. Corfield, of St. George's, Hanover Square.

SAFETY LAMPS.

AN improvement in safety lamps has been devised by M. A. B. Boullenot, sen., of Paris. It consists in replacing the safety lamps usually employed in mines containing fire-damp by lamps supplied with air from outside the mine. Fixed pipes are carried down the mine, and branches are led into all the workings. Through these compressed air is forced from the surface by air-pumps, and the improved lamps are screwed to the air-pipes by couplings with stop-cocks. The cylinder which encloses the flame is protected by a cage, and the products of combustion pass off through two pieces of wire-gauze. The match for lighting the lamp is inserted through a spring clip, ignited within the lamp, and cannot be withdrawn until extinguished.

Communications have been received from:

Mr. John H. Buck, Shepherd's Bush; Mr. Councillor Bailey, Salford; Mr. J. W. North, York; Dr. A. Rabagliati, Bradford; Dr. Horace Swete, Droitwich; Mr. C. P. Symonds, Ormskirk; Mr. Joseph Newton, C.E., Balham; Dr. Griffiths, Sheffield; Mr. G. F. Chambers, Eastbourne; Mr. Alfred Haviland, Northampton; Mr. R. Barnes Austin, Brighton; Dr. George Ross, London; Mr. N. A. Humphreys, London; Mr. G. F. Heath, Paignton; Dr. Gordon, London.

NOTICE.

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* *Manual of Public Health*, Hart, p. 324.

The British Association.

THE SALE OF FOOD AND DRUGS ACT, 1875.

BY G. W. WIGNER AND J. H. SCOTT.

THE object of this paper is to point out the chief points of difference between the 'Adulteration of Food Act, 1872,' and the 'Sale of Food and Drugs Act, 1875,' and to indicate the more salient features of the latter measure. The intention of the writers is not to dogmatise but to suggest, and while disclaiming any pretension to interpret in a strictly legal sense the Act of Parliament, they venture to hope that an intimate acquaintance with the bill in all its stages, and an almost daily consideration of its clauses during its progress through Parliament, with the corresponding clauses in the bill it is intended to supersede, may enable them to render into familiar language the leading provisions of the Act, more especially those which are likely to affect public analysts.

As the Act of 1872 contains only twelve clauses, and that of this year thirty-six, it is impossible to compare the two Acts clause against clause, but it is proposed to consider *seriatim* the provisions of the two bills. It will be understood that except where occasion appears to demand it, the verbiage of the clauses will not be quoted, but only their manifest intent given.

The preamble of the Act of 1872 states that its object is the repression by more effectual laws of the practise of adulterating articles of food and drink and drugs.

The Act of 1875 simply recites that 'it is desirable that the Acts now in force be repealed and that the law regarding the sale of food and drugs in a pure and genuine condition should be amended.

The first law is avowedly to put down the adulteration of food, and yet it contains no definition either of what is meant by 'adulteration' nor what is to be understood by 'food.'

In the new Act the word 'adulteration' is studiously and intentionally dispensed with, the Government confessing their inability either to frame a satisfactory definition or to accept the one which, after much deliberation, the Society of Public Analysts had drawn up, but it does contain a clear and comprehensive definition of what is to be understood by food and drugs, namely:

'The term "food" shall include every article used for food or drink by man, other than drugs or water.

'The term "drug" shall include medicine for internal or external use.'

The fact that water is not to be considered 'food' is important to public analysts, as it will ensure that for water analysis proper fees can be charged.

Clause 1 in the expiring Act, and Clause 3 in the new one, treat of substantially the same offence, and subject the offender to a like penalty; but the phraseology of the later measure appears very much preferable.

According to the former bill, it must be proved that the offender has 'wilfully admixed' the article sold with some foreign substance, which must of itself be 'injurious to health.' In the latter, the words 'knowingly' (which at first appeared) and 'wilfully' are designedly avoided, it being, as is well known, next to impossible to produce proof of such knowledge, and, instead of the adulterant being itself described as 'injurious to health,' its use is only forbidden if it render the article adulterated 'injurious to health.'

In the clause referred to, in the older Act, drugs are placed in exactly the same category as food; and it must also be noted that this clause refers only to the offence of adulterating, the punishment for selling an adulterated article, being a lighter one, provided for in a subsequent section, whereas in the Act of 1875 the punishment is the same for the person selling the debased article as for the person debasing it. In the new Act a wise distinction in the description of the offence, as it regards food and drugs, is drawn, in the former case it being described as 'rendering the article (of food) injurious to health,' and in the latter (drugs) of adding anything 'to affect injuriously the quality or potency of the drug.'

As the penalty, alike for injuriously tampering with the goods and for selling goods so tampered with, is 50*l.* for the first offence, and six months' imprisonment for subsequent offences, and as no proof of knowledge is required in order to ensure a conviction, it will be obvious that, but for some qualification, this clause would in certain cases bear very hardly on tradesmen guilty of no more heinous offence than that of not being experts. The following clause is therefore inserted:

'Provided that no person shall be liable to be convicted under either of the two last foregoing sections of this Act in respect of the sale of any article of food, or of any drug, if he shows to the satisfaction of the justice or court before whom he is charged that he did not know of the article of food or drug sold by him being so mixed, coloured, stained, or powdered as in either of those sections mentioned, and that he could not with reasonable diligence have obtained that knowledge.'

This will give a tradesman who has bought honestly an impure article an opportunity of proving his innocence, and shifting the blame on to the right shoulders. The difference in effect between the corresponding clauses in the two bills is that under the former one no conviction could be secured unless the prosecution could prove that the defendant had 'wilfully' admixed, etc., while under the latter, the proof that the forbidden admixture is present is sufficient, unless the defendant can show to the satisfaction of the justices, that not only did he not know of the impurity, but that 'he could not with reasonable diligence have obtained that knowledge.' The increased effectiveness of the law as it is altered cannot fail to be appreciated.

In Clause 2 of the old bill a penalty of 20*l.* is imposed for selling an article with which 'to the knowledge of the seller,' any ingredient injurious to health is mixed; but as this knowledge must be proved, it is manifest that so far it must be even more inoperative than Clause 1.

It is, however, provided in the same clause, that 'every person who shall sell as unadulterated, an article which is adulterated,' shall be fined, and as this is without the qualification of 'knowingly,' it is only under this section that convictions have been obtained, except in rare instances where the Act has been imperfectly understood and loosely administered.

In Clause 3 of the 1872 Act, selling articles that

have been mixed with other substances for the purpose of increasing weight or bulk is forbidden; but as this, too, must be proved to have been done 'knowingly,' the same difficulty as has been already mentioned exists. In Clause 2, just referred to, the offence is 'selling as unadulterated, an article that is adulterated,' and in the absence of any definition of 'adulteration,' a wide margin was left for differences of opinion as to what was and what was not adulteration.

The corresponding clause (6) in the new Act now reads:

'No person shall sell to the prejudice of the purchaser any article of food or any drug which is not of the nature, substance, and quality of the article demanded by such purchaser, under a penalty not exceeding twenty pounds; provided that an offence shall not be deemed to be committed under this section in the following cases; that is to say,

'1. Where any matter or ingredient not injurious to health has been added to the food or drug because the same is required for the production or preparation thereof as an article of commerce, in a state fit for carriage or consumption, and not fraudulently to increase the bulk, weight, or measure of the food or drug, or conceal the inferior quality thereof;

'2. Where the drug or food is a proprietary medicine, or is the subject of a patent in force, and is supplied in the state required by the specification of the patent;

'3. Where the food or drug is compounded as in this Act mentioned;

'4. Where the food or drug is unavoidably mixed with some extraneous matter in the process of collection or preparation.'

It cannot be denied that under the first and second of these exceptions, articles may be sold which are not chemically pure, but yet, read by the light of common sense, it does not appear that miscarriages of justice are likely to be frequent. Exceptions 2 and 3 will be admitted to be not only unobjectionable but absolutely necessary.

It is very important to notice that by Clause 24 (which appears to be out of its proper place) if any defendant intends to rely upon any of these exceptions for his defence he must prove that the mixture is justified by the exception. The incidence of the onus of proof in this case is of the utmost importance.

In the Bill of 1872 the Pharmacy Act of 1868 was incorporated. In the present measure it is not, and the provisions as to drugs are of the simplest character.

1. The 'quality or potency' of the drug shall not be injuriously affected (Clause 4).

2. Proprietary or patent medicines may be sold (Clause 6).

3. Compounded drugs (as well as compound articles of food) shall be compounded in accordance with the demand of the purchaser (Clause 7).

In the last-named clause it was proposed by the House of Commons to introduce certain stipulations as to drugs being in accordance with the British Pharmacopœia or with sundry other authorities, but it is quite a question whether practically the whole ground is not covered by the simpler method at last decided on.

Clause 8 refers to mixed drugs, and qualifies Clause 7 to the extent that no offence shall be deemed to have been committed if the following conditions, which it is necessary to observe are conjunctive not alternative, are observed.

1. The mixture must be declared by a 'distinctly legible' label.

2. The added matter must not be 'injurious to health.'

3. The admixture must not be intended fraudulently to increase the bulk, weight, or measure, or to conceal the inferior quality of the drug.

It may be open to argument what loopholes for the sale of impure or deleterious drugs may be possible under these exceptions, but it does not seem likely that if they are interpreted fairly there can be much room for adulteration. Clause 9 has no analogue in the old Act. It may be termed the 'abstraction' clause, and makes it punishable to reduce the quality of any article by the abstraction of any part of it 'so as to affect injuriously its quality, substance, or nature.'

This will be admitted by even the most adverse critics of the bill to be a step in the right direction, and it will specially recommend itself to those analysts who have had to deal with the hitherto unpunishable but injurious custom of selling skimmed milk without so declaring it.

Clause 5 in the old and Clause 10 in the new Act, alike relate to the appointing bodies, which remain substantially the same. Under both Acts, the appointments are to be optional to this extent, that the bodies specified may appoint analysts, and when requested by the Local Government Board shall do so, and in the new Act it is further ordered that whenever an appointment has already been made, and the same becomes vacant, the vacancy shall be filled up.

The chief novelty in the clause is the provision that any person directly or indirectly connected with the sale of food or drugs shall be ineligible for the office of public analyst 'for such place.'

This is, however, of course, not retrospective, and will not, therefore, affect any appointments already made.

Clause 11 gives power to any town council, etc., to appoint the analyst for any neighbouring borough or county to act for this district 'during such time as the said appointing body shall think fit,' they making due provision for the payment of the analyst's remuneration.

Clause 12 enacts that when an analyst is appointed, 'any purchaser' shall be entitled, on payment of a fee not exceeding 10*s.* 6*d.* to have any article analysed, but it must be noted in contradistinction to a somewhat similar provision in Clause 9 of the Act of 1872, that the article must be taken direct to the analyst and the fee paid to him instead of both sample and fee being handed to the inspector. This alteration is very unacceptable to some analysts, who fear they will be flooded with private samples at low fees, but an inquiry into the number of samples which have hitherto been taken to the inspector will show that such a fear is exaggerated if not groundless.

This clause also provides that if there be an analyst for the district the purchaser may take his sample to the analyst of another place, but in such case the fee paid shall be 'such as may be agreed upon between such person and the analyst.'

Clause 6 in the 1872 Act and Clause 10 in the Act of this year, referring to the purchase of sample by inspectors, are substantially the same.

They are both open to the objection that they provide only for the analysis of suspected articles, and though theoretically they might lead to the utter

breakdown of the Act, if the inspectors were allowed to purchase samples with public money, and then resolutely refuse to 'suspect' them, yet practically it may safely be left to the appointing bodies to take care that whatever samples are purchased for the purpose of analysis shall be analysed. This clause also makes the important provision that if any district choose to appoint an inspector but not an analyst, the former may take any samples to the analyst of another place, who shall analyse them on terms to be agreed upon between them.

This will enable the authorities of any small place to have a number of analyses performed experimentally, before making a permanent appointment.

It will also be noted that medical officers of health are competent to act as inspectors, and cases may easily be imagined where their power to do so may be productive of much good.

The next point to be considered is the plan prescribed for the taking of samples by the inspectors. The directions in the Act of 1872 are very scanty.

Clause 6 says that the inspector shall procure and submit samples to be analysed by the analyst, and Clause 10 directs that such samples shall be directed and sealed 'in the presence of the analysts by the inspector,' the latter to retain a portion of each sample in case a further analysis should be ordered. It will be necessary to read Clauses 14 and 15 of the new Act. They are,

'14. The person purchasing any article with the intention of submitting the same to analysis shall, after the purchase shall have been completed, forthwith notify to the seller or his agent selling the article his intention to have the same analysed by the public analyst, and shall offer to divide the article into three parts to be then and there separated, and each part to be marked and sealed or fastened up in such manner as its nature will permit, and shall, if required to do so, proceed accordingly, and shall deliver one of the parts to the seller or his agent.

'He shall afterwards retain one of the said parts for future comparison and submit the third part, if he deems it right to have the article analysed, to the analyst.

'15. If the seller or his agent do not accept the offer of the purchaser to divide the article purchased in his presence, the analyst receiving the article for analysis shall divide the same into two parts, and shall seal or fasten up one of those parts, and shall cause it to be delivered, either upon receipt of the sample or when he supplies his certificate to the purchaser, who shall retain the same for production, in case proceedings shall afterwards be taken in the matter.'

It will thus be seen that the inspector, on purchasing a sample, is bound (unless the vendor waive his right) to divide it into three parts there and then, to seal up each portion, hand one to the vendor, take one to his own house, and submit the third one only to the analyst.

From an analyst's point of view, the objections to this plan are very great, as two-thirds of every sample purchased he will never see at all, and if his analysis be disputed, and a second analysis made on the inspector or dealer's portion contradicts his results, he will be more likely even than at present (and with better reason) to doubt if the separate portions have really formed part of the same sample.

Inspectors, too, are not usually so expert at tying up parcels securely, as are shopkeepers, and, if the parcel is only clumsily secured, the difficulty would not be great, and the temptation to a vendor who knew he had sold an impure article would be considerable, to substitute another sample of different quality.

But, beyond this, there is the possibility of such a thing as collusion between an inspector and a shopkeeper, in which case the reputation of the analyst would be in considerable peril.

Most strenuous efforts were made to obtain a modification of this clause during the time the bill was before Parliament, but without success. The feeling outside the chemical circle was universal that a dealer had a fair right to have a portion of any sample upon which he might be prosecuted, left in his own custody, for the purpose of having an independent analysis made, and this is not a claim to be easily gainsaid.

It was then urged on the Government that, if the inspector leave one-third of the sample with the vendor, he should take the other two-thirds, intact, to the analyst, to be there divided; but this very reasonable proposal was not accepted.

Perhaps the analyst might adopt one safeguard by insisting that the quantity of the article should be sufficiently large to ensure that a third part of it would, after his analysis was made, still leave him enough for any further analysis which he might wish in his own defence to have made.

It will be seen that, by Clause 15, if the dealer does not wish to have the article divided it will be taken as now to the analyst entire, and will be divided by him, he handing one part back to the inspector either when he receives it or when sending his certificate.

Clause 16 makes it legal to send samples by post, and this provision, which may be convenient in some cases, has been the cause to a very great extent of the objectionable features in Clause 14.

Clause 17 provides that if a vendor refuses to supply an inspector with any article 'exposed for sale,' or 'on sale by retail' upon the price being tendered for it, he shall be liable to a penalty of 10*l*. This regulation meets a difficulty that has been constantly occurring under the old Act, where, the inspector being known to the dealers, the latter have often absolutely refused to serve them.

It has been urged that the penalty imposed for the offence is too small, and that some vendors would prefer to pay 10*l*. rather than have the impurity of their goods exposed.

It must not, however, be forgotten that if a man were convicted of refusing to serve an inspector, such conviction would hardly do him less injury with his customers than a conviction for adulteration. Moreover, if he looked upon the fine of 10*l*. as only a trifle it would be open to the inspector to pay him a visit daily, and for each refusal to prosecute him. Clause 7 of the 1872 bill enacts that analysts shall report, quarterly to their appointing bodies, and that their reports shall be read at the meetings of the local authorities.

In Clause 19 of the 1875 Act the word 'presented' is substituted for 'read,' but it is further ordered that the appointing bodies shall transmit annually to the Local Government Board a certified copy of each quarterly report of the analyst.

In Clause 9 of the older act it is laid down that 'in the absence of any evidence before the court to

the contrary, the analyst's certificate shall be sufficient evidence of the matters therein certified.'

This is substantially repeated in Clause 21 of the 1875 Act, but is followed by the words, 'unless the defendant shall require that the analyst shall be called as a witness.' For such attendance the analyst of course should be paid, and though the Act itself is silent on the point, the opinion of the Local Government Board is distinctly to that effect.

This clause also provides that the defendant and his wife may tender themselves as witnesses.

Clause 22, which provides that at the discretion of the justices, reference analyses shall be performed by the Somerset House officials, has been throughout strongly (though unsuccessfully) resisted by the analysts, not because they are afraid of having their work checked by chemists of equal standing and experience with themselves, but because the standing and experience of the Inland Revenue chemists is altogether unknown.

However, the clause stands, and it is to be hoped that before the Somerset House laboratory has any food samples submitted to it, care will be taken that their staff is strong enough for the work.

If this is not found to be so, it will behove analysts who are satisfied of their own correctness (and all should be so) to take such precautions as will enable them to vindicate their results, even if they should be contradicted by Somerset House.

Clause 25 provides for the acquittal of a defendant if he can prove to the satisfaction of the justice that he had purchased the article, as the same the purchaser demanded of him, believed it to be the same, and held a warranty from the wholesale dealer that it was so; but unless he has given due notice that he will rely upon this defence, he shall be liable to pay the costs of the prosecution.

Clause 27 provides a punishment for persons guilty of forging warranties or uttering the same, knowing them to be forged, of two years' hard labour—for persons misapplying a warranty (that is, using it for an article other than the one it was given for) to a fine of 20*l*.—for persons giving a false warranty a fine of 20*l*.—and for 'every person who shall wilfully give a label with any article sold by him which shall falsely describe the article sold' a penalty of 20*l*.

In Clause 26 it is provided that all penalties imposed, where prosecutions are instituted by the inspectors on behalf of the local authorities, shall be paid to such inspectors, and by them handed over to the authorities for which they act, 'to be applied towards the expenses of executing this Act, any statute to the contrary notwithstanding.'

The great importance of this new provision will be at once apparent, and it ought to remove all the objections on the score of expense which some boards have urged against the appointment of an analyst, as in many cases the amount of the fines will go a long way towards paying the cost of the prosecutions and the analyst's salary. Hitherto, as is well known, the amount of the penalties recovered has gone to a general police fund.

Clause 28 states that nothing in the present Act shall affect the power of proceeding by indictment or take away any other remedy, or in any way interfere with contracts and bargains between individuals and the rights and remedies belonging thereto, and it further enacts that in any case where a prosecution for breach of contract is instituted, the plaintiff can receive, in addition to all other damages which he has sustained by the breach, 'the amount of any penalty in which he may have been convicted under this Act, together with all costs paid by him upon such conviction, and those incurred by him in and about his defence thereto.'

Clause 30 makes special provision as to the examinations of all tea imported, by persons to be appointed by the Custom House, and to this clause the tea trade attaches great importance.

It will doubtless stop, to a very great extent, the importation of adulterated tea, but will in no way interfere with an examination by public analysts of any suspected sample which may be submitted to them.

In the Adulteration Act, 1872, the form of certificate was left entirely to the taste of the individual analysts and boards.

In the 'Sale of Food and Drugs Act, 1875,' a set form is prescribed, which is printed as a schedule to the bill. It is needlessly cumbrous and wordy, and presents the following objectionable features.

1. The weight of the sample on its receipt, is to be stated, unless this 'cannot be conveniently done.'

2. If the sample is found to be genuine, nothing but the bare fact need be stated; but if it be adulterated it is necessary to give the proportions of the component parts, thus involving a quantitative analysis.

3. In the case of 'milk, butter, or any article liable to decomposition,' the analyst is to report specially whether any change had taken place in the article that would interfere with the analysis.

We have thus reviewed, as briefly as the nature of the matter allowed, the New Act, and after dispassionately considering it, have arrived at the conclusion that, as far as it is possible to form an opinion of the working of an Act of Parliament which has not yet been put into operation, it is a sounder and more comprehensive measure than the one it repeals.

To those who have only seen the bill as originally drafted, and formed their opinion on that draft, this expression of commendation will doubtless be surprising; but probably few Acts of Parliament of the same length have ever undergone a more complete metamorphosis in their passage through the two Houses.

It is not too much to say that the Act, as finally passed, is essentially a different measure to the one introduced in the early part of the Session by the President of the Local Government Board, and that for the very numerous and important amendments introduced, the Society of Public Analysts may honestly lay claim to the largest share of credit.

ON SOME PHYSIOLOGICAL EFFECTS OF VARIOUS DRINKING WATERS.

BY W. J. COOPER.

IN 1870-73 M. Wurtz, the Dean of the École de Médecine, in Paris, presented to the French Academy of Science two important papers by M. F. Papillon. In those papers it was shown that the phosphate of lime in bone is capable of being replaced to a considerable extent by the phosphates of strontia, alumina, and magnesia. The first experiments of M. Papillon were commenced on Monday, September 6, 1869. He took a young pigeon, shut it up in a cage, and fed it with wheat rolled into a fine paste, and

mixed with some phosphate of strontia and a solution of chlorides, carbonates, sulphates, and nitrates of potash in the proportion of one and a half grammes to the litre of distilled water; a small quantity of hydrochloric acid was also added. On April 1, 1870, the pigeon was killed. An analysis of the bone-ash showed :—

Lime	46·75
Strontia	8·45
Phosphoric acid	41·80
Phosphate of Magnesia	1·80
Residue	1·10
	99·90

Another pigeon on the same date as the preceding was supplied daily with a solution of phosphate and carbonate of magnesia, and distilled water. Killed on April 4. The analysis of bone-ash showed :—

Lime	51·76
Magnesia	1·81

On September 16, 1869, a white rat, six days old, was treated daily with a decigramme of phosphate of alumina in a litre of distilled water, with rice and gluten. On November 29, 1869, the rat died suddenly of convulsions. A *post mortem* examination showed inflammation of the intestines, attributed to the mechanical effect of nodules of phosphate of alumina. The rat was boiled in distilled water, and then boned. The bone-ash contained—

Lime	41·10
Alumina	6·95

On the same date as the first rat, a little rat of the same litter was put under the same conditions, except that in place of phosphate of alumina, phosphate of magnesia was administered. This rat was killed on November 25, 1869, apparently quite healthy. The bone-ash was found to contain—

Lime	46·15
Magnesia	3·56

May 21.—Six chickens, just hatched, were taken; one killed immediately; others fed with rice, cooked in distilled water, with phosphate and carbonate of magnesia added to the ordinary salts in the water they drank.

June 28.—Rice replaced by wheat, cooked as the rice.

The five chickens were killed at different periods.

	Ash showed in analysis.	
1st—July 4, 24 days old	Lime	53·45
	Magnesia	0·83
2nd—July 12, 31 days old	Lime	51·59
	Magnesia	0·90
Three others, 41 days old	Lime	50·51
	Magnesia	2·01

There were only inappreciable traces of magnesia in the bones of the chicken killed at the moment of its birth. The bones of all these animals had preserved their ordinary aspect and physiological properties, and there was no disturbance of the normal functions of the system. Bone-ash, as is known, consists of phosphate of lime, with about 2 per cent. of phosphate of magnesia, and more or less carbonate of lime. The full importance of these experiments does not seem to have been fully appreciated. It is not only shown that the food which is eaten affects the composition of the bones, but that mineral matter in dilute solution is capable of being assimilated. The experiments are, in fact, experiments on different kinds of artificial drinking-waters, and illustrate how profoundly the bodies of animals are influenced by the mineral constituents of the water which they drink. They seem to show that the effect of altering the composition of the water-supply of a community might involve questions of vast importance to the organic structure of the human body, if the very composition of our bones is affected by the quality of the water. If the water contains lime, lime may be taken up and would appear as phosphate of lime in the bones; if strontia, as phosphate of strontia; if magnesia, as phosphate of magnesia. If by any combination of circumstances these salts should be deficient, the bones would be imperfectly supplied with mineral matter. It is said that such instances have occurred in Holland in districts where the inhabitants can only obtain rain-water for drinking purposes. This fact, probably combined with an absence of lime in their food, occasions a softening and distortion of the bones of the body. By varying a water-supply it might be possible to alter the physical organisation of a population, and in future ages, from the examination of the bones of bygone generations, the character of the water they were in the habit of drinking might possibly be deduced. So much attention is now directed to organic impurity in drinking-water (a defect which can be completely remedied by careful filtration) that the inorganic impurities have been almost overlooked, although there are numerous instances where serious consequences have arisen from the incautious use of deep spring-waters. Some time ago at Hendon, in Middlesex, an artesian well was bored to supply the water necessary for some valuable horses which were being reared there. The water was bright looking, pleasant to the taste, and quite free from any organic impurity; the foals, however, who drank the water soon died, and the whole stud were seriously affected with diarrhœa. Professor Way, one of the Royal Commissioners on Water Supply, analysed the water, and it was found to contain sulphates of magnesia and soda in considerable quantity. On discontinuing the use of the water the disease was arrested. A similar case occurred at Rugby, but in that instance human beings were the sufferers. The water from an artesian well free from organic impurity was hailed with satisfaction at its brightness; the community, however, were attacked with diarrhœa caused by the sulphate of magnesia or Epsom salts present in the water, and the supply had to be discontinued, as there is no known method of freeing the water from sulphates. The opinions of some leading authorities on water-supply have undergone considerable modification recently. A few years ago Dr. Frankland returned all solid matters in water as impurities in the analyses he made. I was therefore much surprised to hear him recommend as a supply to a district containing 14,000 inhabitants a water proved by analysis to contain twelve and a half grains of anhydrous sulphate of magnesia per gallon, equal to twenty-five grains per gallon of Epsom salts. This evidence was given last session before a Committee of the House of Commons. Dr. Frankland stated that it was absurd to say that a water containing such a quantity of Epsom salts could be objectionable from a dietetic point of view. Fortunately for the health of the people the Parliamentary Committee refused to allow the district to be supplied with the Epsom salt solution. The water of St. Ann's Well, at Buxton, the slight purgative quality of which is considered as one of its merits, contains an amount of magnesia equal to thirteen grains of Epsom salts per gallon. It is known that

goitre and other throat and glandular affections and even idiocy have been attributed to inorganic salts in drinking water. We know that the human system is easily deranged by a change in the drinking water. The spa and chalybeate waters at the favourite places of resort have been renowned for ages for their medicinal virtues. If the entire organic structures of the human body are liable to alteration when excess of mineral matter is introduced into the system, it is essential that health-seekers at these medicinal springs should place themselves under medical supervision. And one of the first considerations in the inauguration of a water-supply should be to ensure a perfect freedom from excess of any mineral except those comparatively harmless ingredients—chloride of sodium and carbonate of lime.

THE TREATMENT OF SEWAGE.

BY J. C. MELLISS, C.E.

ALTHOUGH it is to be regretted that another year has passed without further and much-to-be desired legislation upon sanitary matters, it is not difficult to see reasons for the inability of Government to deal off-hand with the subject which, in the form of the Rivers Pollution Bill, Lord Salisbury so ably introduced to the House of Lords during the past session. The Government is scarcely yet in a position to define the extent to which pollution of rivers is to be prevented, or even what the term 'pollution' really includes. These points will doubtless, together with a definition of the term 'best known practicable means for purification of town sewage and manufacturing refuse,' occupy the attention of the Local Government Board before the re-assembling of Parliament. But until the Government takes the rivers under its own supervision, and lays down some clear guiding rules on these points, we shall not, I think, see much practical sanitary reform in this direction. The purification of our rivers is, however, in fact, a much simpler matter than is generally supposed. Their pollution is caused chiefly by town sewage and manufacturing refuse, and both of these can now be purified at a cost that would neither ruin nor even press heavily upon ratepayers or manufacturers. But the subject requires to be taken in hand in an earnest, vigorous manner, very different from the dilatory spirit which has to a great extent characterised it during the past. Liebig's words are eminently applicable to the treatment of sewage when he says: 'Whenever success does not attend a good cause, the fault lies in want of energy in using the proper means, for these are always to be found.' There are various means already known for the purification of sewage and manufacturing refuse, each of them possessing some merit, but also much that is impracticable. My present purpose is, however, to give a brief account of the means by which, during the past sixteen months a daily flow of two million gallons of polluting liquid, being the whole sewage and manufacturing refuse from one of our large manufacturing towns, has been completely purified, and a river, one of the tributaries of the Avon, which formerly received it, also so completely purified as to satisfy all parties concerned in the neighbourhood. Not only in a sanitary point of view is the purification of this river approved of, but a return of fishes to its waters testifies to the value of the work which has been accomplished. I refer to the town of Coventry, the population of which is 40, 4.. by the breach, 'the amount of factories, there are may have been convicted und The sewage and refuse all costs paid by him upo two million gallons in twenty-[illegible]ed by him in and consequence of the refuse dye, it is [illegible] tionally foul character, and far more polluting [illegible] ordinary town sewage where no manufacturing refuse exists, and on this account also more difficult to purify. The Corporation of Coventry tried various schemes to enable it to comply with an order by the Court of Chancery to discontinue the pollution of the river Sherburne; but all of them failed in a more or less degree to accomplish the desired object. After these various trials and failures, works for chemical treatment of this sewage and manufacturing refuse by means of sulphate of alumina and lime were commenced by the General Sewage Company about two years ago, and completed in the month of April last year. Since then, when the works were opened for the first time, they have been in constant operation, and exhibit in a most satisfactory manner that the work of purifying our rivers can, without doubt, be accomplished at a moderate cost. The sewage and manufacturing refuse, mixed together, to the amount of two million gallons daily, is received at the works as it flows from the town in a continuous stream. The sewage, strained and freed from its grosser contents, passes through a block of buildings where it receives continuously a charge of sulphate of alumina in solution, and is thoroughly mixed therewith. These buildings are well provided with steam engines, boilers, and mixers, as well as ample machinery of a first-class character, adapted not only for the admixture of the chemicals with the sewage, but also for the manufacture of the chemicals employed. The effluent water is in a sufficient state of purity to enter most rivers or the sea. It is, however, in this condition, subjected to a process of filtration, and for that purpose is conveyed to a filter-bed properly drained and prepared. It has been found that a comparatively small quantity of land, four acres and a half, would suffice to filter the effluent water from the sewage of Coventry. Nine acres have, however, been prepared, for the purpose of always having another filter-bed ready when the one last in use requires rest or repair. The effluent water, as it passes into the river Sherburne from the three large mains of the filter, at the rate of about 80,000 gallons per hour, is clear and bright, and not only so, but of a high standard of purity, as is shown by the analysis of it made by Dr. Voelcker,* who says: 'The water has no perceptible smell, and is almost free from colour; it contains but little organic (albuminoid) ammonia, and not much more than half a grain of saline ammonia per gallon. And, further, that the nitrogenous organic constituents of raw sewage appear to have become oxydised and changed into nitrates to a very large extent.' The sewage of Coventry, at noon, has been found to contain as much as 5·85 parts of ammonia in 100,000 parts. Having thus succeeded in purifying this enormous volume of liquid, and produced an effluent water of a standard of purity such as to support life, the reduction of the solid precipitated matter, or 'sludge' as it is called, into a portable form, is none the less important; otherwise, the measures employed for the purification of a river would only

* See the SANITARY RECORD, June 5, 1875, p. 371, 'Special Report on the Coventry Sewage Works.'

mixed with some phosphate of strontia of chlorides, carbonates, sulphates and of potash in the proportion of grammes to the litre. The quantity of Agra

accumulation of enormous quantities of matter, which would cause as great a nuisance on the land as it would if cast into the sewer. The amount of 'sludge,' containing 80 per cent. of water, precipitated from two million gallons at Coventry, is about twenty tons per day. It is this very large quantity of 'sludge' that, by clogging and choking the pores of a filter on the ground, would render the filtration of crude sewage on a large scale impracticable, and form one of the various objections to sewage farming. It is necessary, therefore, in order that the purification of sewage and manufacturing refuse by chemical precipitation should be successful in a sanitary point of view, that this sludge should, each day as it is produced, be converted into a portable condition by depriving it of its water. At the Coventry works, this is accomplished by means of atmospheric filters, the sludge being afterwards completely dried, either by passing it through Messrs. Milburn's drying machines, or by absorption of the moisture contained in it through admixture with chemicals, which, at the same time that they form a drying medium, also add a fertilising agent to the manure so produced. What therefore has been done at Coventry can be done elsewhere; and although the purification of sewage and manufacturing refuse cannot be carried out without a certain charge upon ratepayers and consumers of manufactured goods, that charge need be but a moderate one. Manufacturing refuse will have to be either cast into the sewers, as is the case at Coventry, or dealt with separately, according to arrangement. The latter will, I believe, be the plan most generally adopted in the end, where practicable, because manufacturers will begin to find that what is now in many instances cast away as useless will some day be turned to account. The process in use at Coventry requires chemicals to the value of *2l.* 12*s.* 10*d.* for the purification of one million gallons, and these chemicals are easily obtainable in any quantities in this country. The process is applicable, also (and has been experimentally tried with success), to other manufacturing refuse, including that from paper mills, fell-mongers, and tanneries. The one great object in view in carrying out these works at Coventry has been to achieve a sanitary success at a moderate cost, irrespective of party feeling or short-sighted policy.

In the course of a short discussion which followed the reading of the paper, Mr. Towle, of Oxford, spoke warmly in favour of utilising sewage on land. The specimens of effluent water produced was, after all, sewage, and he should not like to drink it. On the previous night he said a great deal of time had been occupied in proving that only one death per day resulted from railway accidents; but he contended that there were upwards of 200 deaths daily from infectious diseases caused by defective drainage and the unwillingness manifested to utilise sewage on the land.

Mr. Melliss said he had seen the water drunk, and the persons who consumed it appeared none the worse. In reply to a question, he said the sewage operations at Coventry cost about 5*d.* or 6*d.* per head of the population.

THE salary of Dr. John F. W. Tatham, medical officer of health for the Salford urban sanitary district, has been increased from 400*l.* to 500*l.* per annum.

SEWAGE EXPERIMENTS.

BY PROFESSOR CORFIELD, M.D.

PROFESSOR CORFIELD, M.D., presented the report of the sewage committee. He said the report this year was short, as the experiments were very incomplete owing to the want of funds for the purpose of analysis, and paying servants to observe, and so on; but he dared say a great many of them knew a gentleman of that section had supplied them with funds, and would continue to do so indefinitely, so that next year they would be able to give a much more detailed report and upon a larger number of observations. However, some results had been obtained this year which were of considerable importance, and which showed to a very great extent the accuracy of the methods adopted, although this year methods had been carried out so imperfectly. The report dealt in its first part with the sewage farm near Romford. During the past year the total weight of crops grown on the farm was 200 tons less than in the previous year. The reasons for this were that the kind of crops grown was different; a large amount of land was allowed to lie fallow, and a certain quantity of crops ploughed in and not carried off the land. When they came to take the number of acres of land planted during the last year, and to examine them in connection with the weight of crops grown and the weight of nitrogen in these crops, they found that the weight of produce per acre had been progressively increasing during the last three years, but last year the weight of produce per acre was considerably more than the year before, while the weight in the year before was greater than in the year before that. In the year 1872-3 the weight of produce grown was 10·9 tons per acre planted; in 1873-4, 13·8 tons; in 1874-5, 16·5 tons. The same result was seen in the amount of nitrogen recovered in the crops, as in the first year there was 101 pounds, in the second year 133 pounds, in the third year 153 pounds; so that, although the total amount of crops produced had been less, when they came to consider the amount of land on which they had been produced, the total amount of crops and nitrogen was more. The result was due to two causes (1), the concentration of sewage on fewer acres; and (2) to the increasing richness of the soil, a fact which had already been demonstrated by the committee in their fifth report. The year 1871-2 formed an apparent exception. The amount of crop then grown was greater than had ever been known on the farm; that is to say, it was never equalled since. But it was only an apparent exception. Then there were no cereals grown on the farm; there had been much more grass and mangolds, and so on. The amount of produce per acre then was less than the year they were now reporting on. The results of analyses between April, 1874, and March, 1875, showed that the total nitrogen of the sewage was very near to the average results already obtained; thus in the year 1871-72 the average was 5·529, and in 1872-73 it was 5·151 per 100,000. The total amount of nitrogen recovered in the crops was estimated at 20,166lb., or 31·8 per cent. of the nitrogen supplied, being exactly the mean of the amounts for the two last years. The amount of nitrogen lost in the effluent water could not be ascertained, as the amount of the effluent water was not known.

THE
SANITARY RECORD.
SATURDAY, SEPTEMBER 11, 1875.

PREVENTION OF INFECTIOUS DISEASE AMONG CHILDREN.

THERE is probably no question connected with public hygiene of more practical interest than the settlement of the course to be pursued in preventing the extension of epidemic or contagious diseases when occurring among children, especially when we consider not only the very considerable immediate mortality they occasion, but also the constitutional mischief which so frequently follows in their train, among those who have lived through an attack. We therefore propose in the following remarks, to make a few suggestions, which we trust will be of service in educating those who, according to our experience, stand so much in need of information, viz., the heads of families, preceptors having charge of the youth of both sexes in our public and private schools, the superintendents of our public institutions, such as orphanages and workhouses, and very many of our brethren in general practice.

First as to the heads of families. On the outbreak of epidemic disease in a private family, it should be at once the duty of the medical attendant, so soon as he has recognised the character of the disease, or even earlier, if the case be suspicious, to direct the isolation of the patient, by placing him or her in a room, as remote as possible from the rest of the family; in country houses this may be oft-times readily effected; in urban houses, on the contrary, it is more difficult, and here we would advise that the child be placed in the highest room in the house. Care should also be taken to remove with the patient all clothing that has been recently worn, and to thoroughly disinfect the apartment from whence the removal has been made. It should be enjoined on the parents that none but the immediate attendants should be permitted to enter the sick chamber, and that the mother should refrain from needless caresses, the indulgence in which is a fruitful source of contamination to her other children.

Among the humbler classes, and especially those occupying only one, or at most but two rooms, such isolation is impracticable, and it will, therefore, become necessary to invoke other agencies. Now, although the State, in our large towns, has made provision for the reception and treatment of adults of the humbler classes, who may be suffering from communicable disease, nothing of the kind exists on a sufficient scale for the accommodation of children, and yet, as we have above stated, contagious disease may be as destructive to life in them as to adults, with the superaddition that those it does not immediately destroy it may, by sowing the seeds of scrofula or renal disease, permanently disable. To obviate the danger, which so frequently arises, of the extension of such disease to other families residing in the same house, or it may be hamlet, we would advise medical officers of health and poor law medical officers, that they should urge on their respective sanitary authorities, whether urban or rural, the advisability of establishing children's hospitals for infectious diseases. In large towns such hospital could either be built to house several children, or some disused dwelling-house in an airy neighbourhood might be utilised for such a purpose; while, in small towns and rural districts, the accommodation of a cottage hospital would be found sufficient. In districts where such hospitals shall have been provided, we would constitute it a misdemeanour for parents to keep their children at home, in any case where the medical attendant advises their removal to a contagious hospital, and to obviate the objection which would be raised on the ground of expense, we would call on the parents of the children to contribute to their support whilst in hospital, on a scale to be determined on some general principle, whilst the children of the pauper class we would have at once removed to the workhouse hospital.

Passing to the next phase of the subject, the arrangements which should be made in our public institutions, whether they be self or State supported, it has always appeared to us as desirable that in every such public building a room, or ward, should be permanently set apart, so that, at a moment's notice, it might be utilised for the reception of any youthful patient, the nature of whose malady was either declared or was yet doubtful. A medical attendant should always be enabled to cut short an outbreak of epidemic disease, by taking care that there should be such a room for isolation permanently provided.

The advisability of the adoption of the course here suggested was first practically taught us by an incident which occurred in our school-days. One Sunday morning in June, some three weeks before the holidays, all the available horses in the town were put in requisition to remove to their respective homes all the pupils of the school, the writer included. A boy had been taken ill, and the resident Æsculapius having been called in, he, without waiting to ascertain whether his diagnosis was correct, oracularly asserted it was a case of scarlet fever, and advised the immediate break-up of the school. Now had he removed the boy to a distant room and disinfected the bedding and apartment in which he had slept we might have continued at school, and the possible extension of a dreadful scourge among our respective families would have been obviated—that is, on the supposition that it was a case of scarlet fever; but it turned out in

reality to be a harmless rash, which next day disappeared.

We write the more earnestly on this latter point, as we are aware that many general practitioners would be equally ill advised with the one whose error in diagnosis led to our enforced journey that Sabbath morning; and we here reiterate our opinion, that it is not advisable to break up an institution because one of its members is really or presumably affected, but rather to secure that the youthful patient should be promptly removed to some suitable locality.

Now what is correct in our public institutions applies with equal force to the more limited area of a private family. It has come to our knowledge, that not long since a delicate boy, one of three, was taken seriously ill; the diagnosis, so often the case in malignant scarlet fever, was at first obscure, and it was only a few hours before death that a certainty as to its nature was come to. The mother who nursed him had an infant at the breast, who was also so soon attacked that it became obvious that the *origo mali* had operated all but simultaneously in both instances. All three children, it may be observed, had slept in the same bedroom. The parents becoming frightened, called in another medical man, who on his way to the house asked the father whether the second child had not been sent away, and finding she had not, proceeded to condemn the original medical attendant for his error in judgment in not at once sending both of the apparently unaffected children from home, failing to perceive, in his desire to differ from his brother practitioner, that he was suggesting the adoption of a course which would infallibly have led to an outbreak of disease elsewhere.

VENTILATION OF SEWERS.

WE have before us the report of a paper by Mr. F. Ashmead on the sewerage of Bristol, which was read on Tuesday, August 31, before the Physical Science Department of the British Association. We are not about to consider the general subject of the paper. No doubt the sewer work has been well done, and, from an engineering point of view, successfully; whilst the ratepayers have no reason to complain of the excessive cost, viz., 15*s.* 9¼*d.* per head. This is much under the ordinary estimate for such works. We must, however, with the chairman of the meeting, express a feeling of surprise that no provision is made for the ventilation of the sewers. We ask most seriously whether the extra cost which would have been entailed by making provision for ventilation would not have been an expenditure of capital likely to produce a much more profitable return than any other part of the work, whilst it would have added very little to the main bill of costs.

We commend the way in which the work has been done, if Mr. Ashmead's statement that it has not been necessary to have recourse to flushing is correct, 'because there has been no deposit of any kind in the new sewers,' but the omission to provide for their ventilation will undoubtedly do more serious damage than the presence of some deposit in the sewers would have done if free ventilation had been provided. Free ventilation may counteract the effect of deposit when it takes place, but if no ventilation is provided for, then at some time, sooner or later, there will be accidental deposit for some one district or other, and if that deposit contains materials capable of setting up enthetic disease, these sewer gases will inevitably be conveyed into the houses of the unfortunate inhabitants, and produce all manner of enthetic evil. The perfect sewer work has hitherto prevented the extensive development of mischief. But Mr. Ashmead says 'The sewers are without any external openings or means of ventilation, the whole of the street gullies are trapped and the manholes are all closed down, in which particulars the sewers of Bristol differ from those of nearly all other towns, all external air being excluded.' What is this but to describe the sewer system which has been carried out in other places, such as Croydon, and which answered admirably for some time, until it was discovered that a serious evil existed? It is true, in Croydon, the sewers were not laid so well as they appear to have been at Bristol; they soon became sewers of deposit, and the evil became more rapidly manifest, and culminated in an epidemic in 1865. This epidemic only subsided as the sewers were ventilated—its disappearance following upon the steps of the workmen who ventilated the sewers; the same event will some day arise at Bristol, unless the authorities take warning by the experience of other places. They have full knowledge of these points, for, if we recollect aright, they were submitted to the notice of the Bristol people some years ago by Dr. Alfred Carpenter, of Croydon. The warning given by various speakers during the discussion upon Mr. Ashmead's paper should not be without effect. Captain Galton's experience is like to that of numbers of visitors to Bristol. It is impossible for a town to be safe whilst such things are allowed to exist. The sewer authority at Bristol may be learned men and may think we are mistaken in the view of the matters which we take. It appears to us, however, that they are imitating the ostrich in the desert, hiding the possibility of danger from view only to meet with greater disaster the longer its consideration is delayed.

Science and experience both show us that, do as we will, free ventilation is alone a safety for a water-carriage system of sewers. Surely the Bristol authorities do not allow their sewer men to enter the sewers that are unventilated! If they do, it is a scientific wonder how they manage to get out again.

Seriously, however, the idea that the Bristol sewers are not ventilated at all is a myth; they must ventilate somehow or other, because the numerous openings which naturally exist produce a moderate amount of natural ventilation which at present goes in safe directions; some day it will invade other districts with disastrous consequences. We urge upon the authorities to take care that it shall continue to go into uninhabited regions, and not into the houses of the people, and this can only be done by providing inlets in the lower regions and outlets in the higher, which shall convey the sewer gases into the upper regions of the air as the chimneys of our houses do the products of combustion from coal. If every soil-pipe is properly ventilated, and inlets are provided below, the Bristol people will be safe, but not till then.

THE NEW ADULTERATION ACT.

THE 'Sale of Food and Drugs Act,' to which we briefly adverted in a recent number, will come into operation on the 1st proximo, and in anticipation of that event Messrs. G. W. Wigner and J. H. Scott have written a joint paper for the purpose of aiding public analysts and others in understanding the new Act, and of indicating the points of agreement and divergence between the expiring law and the one which is to supersede it.

As we reproduce the paper *in extenso*, it is needless to review it at any length, but we may just notice a few of the more striking points to which it calls attention.

A great obstacle in the way of securing convictions under the old act was the necessity of proving 'knowledge' on the part of the person accused of adulteration. This is now altered, and where adulteration is found to be present knowledge on the part of the defendant is taken for granted, the onus of proving that he didn't know and couldn't know of the impurity being laid upon him.

If, however, the vendor can show that he bought the article, believing it to be pure, and obtained a 'warranty' from the wholesale dealer, the latter is to be held responsible, very severe penalties being imposed for the forgery or misapplication of a warranty.

Another feature which is peculiar to the new Act is making the abstraction of any important constituent of an article illegal; such, for instance, as the illicit skimming of milk, which public analysts tell us has been so common a practice hitherto.

It is also pointed out as another improvement, that a tradesman is now compelled (under a fine of 10*l.*) to supply an inspector, on the proper purchase money being tendered.

On the other hand, the tradesman is now to have the right of keeping a third part of any sample sold for the purpose of analysis, in order that he may, if he thinks fit, have an independent examination made.

It is also now enacted that all fines recovered under the Act shall be devoted to the expense of working the same, instead of going, as hitherto, to a general police fund.

The other very numerous alterations and additions which have been made are commented on *seriatim*, and we cordially recommend a perusal of the paper to all persons in any way interested in the operation of the new law.

As Messrs. Wigner and Scott have had exceptional means of familiarising themselves with the Act not only in its finished state, but during its entire passage through Parliament, it is very satisfactory to know that they have arrived at the conclusion—in opposition on the one hand to prejudiced trade organs, and on the other to some imperfectly informed scientific journals—that the Sale of Food and Drugs Act 'is a sounder and more comprehensive measure than the one it repeals.'

Notes of the Week.

THE THAMES VALLEY.

THE Local Government Board have decided to institute a preliminary inquiry by one of their own inspectors, with a view to the adoption of some general system of sewerage for the towns in the Thames Valley, and also to the formation of a united sanitary authority for the entire district.

EARLY CLOSING AND SANITATION.

A DEPUTATION from the Glasgow Drapers Early Closing Association waited upon the commissioners appointed to inquire into the working of the Factories and Workshop Acts, urging upon them to deal with the evils of long hours and bad sanitary arrangements in houses of business, especially in relation to the health of women and children. The commission had been sitting at Glasgow during the week under the presidency of Sir James Ferguson.

THE ARTISANS' DWELLINGS ACT.

THE inhabitants of York, in common with those of many other towns, are not disposed to allow the Artisans' Dwellings Act to remain a dead-letter. A memorial, signed by two justices of the peace and others, has been sent to the medical officer of health, pointing out that the district known as Waterlanes is in a most deplorable condition in every way, and in its present condition a disgrace and scandal to the city. The subject was brought under the notice of the sanitary authority by the medical officer of health, and was, after some discussion, referred for future consideration.

CONTAGION BY DIRTY LINEN.

DR. SEDGEWICK SAUNDERS, medical officer of health for the City of London, in his report on the health of his district, gives a striking instance of the mode by which contagion may be conveyed by dirty linen. A policeman had two children who had recovered from scarlet fever. Their clothes were sent to a laundress, whose children were in perfect health, yet they shortly afterwards sickened for scarlet fever. It was proved, in the inquiry which ensued, that the policeman had acquainted the laundress with the facts of sickness in his family, and, in consequence, he was exonerated from legal proceedings. We would, however, insist upon a compulsory disinfection of all the clothing used by infectious patients.

DUTIES OF LOCAL BOARDS.

THE secretary of the Central Board of Health, Melbourne, made some remarks which cannot be too widely disseminated. 'It will be the duty of the local boards, in presence of disease, to enforce with increased energy the abolition of those general insanitary conditions, such as defective drainage, filthy or overflowing cesspools, want of cleanliness about back-yards and premises, over-crowding, defective ventilation, etc., which tend to lower the healthiness of any place where they are allowed to exist.'

INSTRUCTION IN STATE MEDICINE.

THE extension of the duties and functions of medical officers of health, which has been entailed by recent legislation, has necessitated a special course of study for candidates for state appointments. This course of study will probably be indispensable to those who may wish to provide themselves with the state medicine diploma of the universities or examining bodies who propose to grant them. We believe that the authorities of University College have made special arrangements for instruction in state medicine under the guidance of Professor Corfield and Professor Williamson.

The course includes, in addition to a course of lectures on hygiene and public health, a complete laboratory course. This we believe to be the first attempt which has been made to organise systematically a course of instruction in state medicine in a medical school, though, no doubt, the example will be followed elsewhere, as preventive medicine is now looked upon as an essential branch of study for the medical student.

THE DUBLIN SANITARY ASSOCIATION.

AT a recent meeting of the Dublin Sanitary Association the following resolutions were passed.

'That this committee have heard with deep regret of the death of Dr. D. Toler T. Maunsell, a member of the committee, who ever took an active part in the work of the association, and in the promotion of sanitary reform in Ireland. This committee desire to express their sympathy with Dr. Maunsell's family in their sad bereavement, and hereby authorise the hon. secretary to forward a copy of this resolution to Mrs. Maunsell.'

The committee then proceeded to consider the desirability of having some action taken in Dublin under the provisions of the Artisans' Buildings Act.

After some discussion, it was resolved—

'That this committee, having considered the provisions of the Artisans' and Labourers' Dwellings Improvement Act of 1875, are of opinion that the Act is specially applicable to the City of Dublin; and that no time should be lost by the consulting sanitary officer and the sanitary authorities in taking advantage of its provisions, which afford great facilities for the permanent sanitary improvement of the city.'

WHOLESALE POISONING.

TWO fresh instances of the reckless manner in which poisons are dealt with by the wholesale dealers have just occurred. In the Hatcham case so little attention was paid to the packing of arsenic in transit, that quantities of it dropped along the roadside, to be picked up by children and eaten in mistake for sweetstuff. In the case of the Norwood poisonings the man Hunt had in his possession a six-ounce bottle, three-quarters full of strychnine, enough to kill thirty people at least. In the beginning of the year we recorded the case in which sixty men were poisoned, fortunately not fatally, by arsenic having been put in the water-tank of an arsenic factory. These cases all point to the conclusion that more supervision ought to be enforced in the wholesale, as well as the retail dealing with such deadly poisons. It seems in the case of arsenic, specially, that familiarity with danger breeds not only contempt but criminal negligence. In Cornwall the lives of sixty men were endangered by some wretch who had free access to the stores, and in Hatcham so little account seems to have been taken that it is allowed negligently to drop along the roadside through careless packing.

These facts point to the necessity which exists for the more thorough supervision of poisons in bulk than appears to exist at present. In the case of articles subject to excise or customs' duty, the system of inspection of checks and counter checks is perfect, whilst in the matter of poisons, so long as they have not reached the retailer there seems practically to be little or no care bestowed upon them.

SALE OF FOOD AND DRUGS ACTS.

THE following notice, dated the 6th inst., has been issued from the General Post Office. 'Under the provisions of the sixteenth clause of the Sale of Food and Drugs Act, 38 and 39 Vict., c. 63, which is appointed to come into operation on October 1 next, the following regulations have been laid down by the Postmaster General, in regard to the conveyance and delivery of such articles as are permitted by the Act to be forwarded to duly appointed analysts as registered letters through the post. 1. Each packet must be addressed according to the official designation of the analyst, as "Public Analyst," or otherwise, and the nature of its contents must be stated on the front of the packet. 2. Any postmaster, at whose office a packet for a public analyst shall be tendered for registration, may refuse to accept it for this purpose, unless it be packed in so secure a manner as to render it at least unlikely that its contents will escape and injure the correspondence. 3. Liquids for analysts shall be contained in stout bottles or bladders, which shall be inclosed in strong wooden boxes with rounded edges, the boxes being covered by stout wrappers of paper or cloth; and no such packet shall exceed eight inches in length, four inches in width, or three inches in depth. 4. No packet whatever addressed to a public analyst, shall exceed the dimensions of eighteen inches in length, nine inches in width, or six inches in depth. The postage and registration fee on each packet must, of course, be prepaid.'

SPONTANEOUS COMBUSTION.

THE inquiry which was concluded last Friday at Greenwich as to the cause of the burning of the *Aurora*, ended in a conclusion to the effect that it arose from spontaneous combustion. It seemed equally certain, from the evidence given, that the fire had originated in that part of the hold in which a quantity of wool was stowed. Of course it was not possible under the circumstances to attach blame to anybody, and the captain of the ship got his certificate returned to him, and was exempted from censure of any kind. It is not for us to find fault with the decision of the magistrate in this particular case, but it does appear palpably to our minds that, as a general rule, the precautions made against fire on board ship are inadequate to their purpose. Whenever a vessel is laden with a cargo of an inflammable kind, and the unfortunate *Aurora* was especially so, there should be laid horizontally in the hold a series of perforated iron pipes meeting in the centre and having an uptake to the deck. The central pipe and its radiating branches should embrace the entire area of the hold, and permeate, as it were, throughout it. The main pipe ought to be connected to a small centrifugal pump or fan to be worked by a donkey engine on deck, or a crank propelled by manual power. By these means the gases liberated from coal, wool, or from other materials deposited in the vessel, might readily be exhausted and got rid of. Some arrangement of this kind, together with thermometers and gas indicators, are the only effective means for preventing the recurrence of such disasters as that which caused the destruction of the *Aurora* and her valuable freight. Even in cases where explosions do not occur, the spontaneous generation of gases must have a deleterious effect on the health of the crew and passengers of a vessel, and a plan which would provide an outlet for these gases would be a well-timed measure of precaution.

LIFE-SAVING APPARATUS.

MR. HEDLEY, the celebrated constructor of steam yachts and launches, is now engaged in building a collapsible or folding-boat. This remarkable specimen of naval architecture on a small scale is intended for use on board emigrant and other ships. Its peculiarities are that when not required for active service it can be folded up, and may be stowed away in very small compass, and that when wanted it may be opened out and used readily for the saving of life.

It has often been remarked that ships' boats are inadequate in times of emergency, and that through over-crowding, passengers, in endeavouring to escape by them from a sinking vessel, are in a worse predicament than if they had remained on the wreck. Mr. Hedley's plan of making boats which will lie on the deck of a ship in a space so limited as that their presence would scarcely be noticed, and which yet are capable of being extended, umbrella-like, when they are needed, seems to us to be invaluable.

The first boat of this kind, now in course of construction at North Greenwich, is forty-two feet in length, and when expanded for use will be thirteen feet in width. It is calculated to hold 170 persons, and is composed of a series of hinged flaps of tough wood, and chemically impregnated canvas.

When in a state of collapse half a dozen such boats might easily be deposited on board an emigrant or other ship without occupying much space. Ordinary boats, on the other hand, would take up much room and be always in the way. We shall look forward to the launching of Hedley's collapsible boat with much interest.

A SANITARY AND NURSING ASSOCIATION.

MANY of those who feel the very warmest interest in sanitary progress scarcely yet realise the valuable assistance which may be rendered by sanitary associations and nursing institutes, if well managed and properly supported. These institutions are too often allowed to languish for want of the sinews of war, and their usefulness is thus all but paralysed. We do not pretend that sanitary associations can stand in the stead of a sanitary authority or a medical officer of health; but where these latter exist a sanitary association may strengthen the hands of the medical officer of health in a manner that cannot be effected by paid inspectors of nuisances. It is very gratifying to hear of any of these associations showing vitality after ten years' existence. Some little time since the Derby and Derbyshire Nursing and Sanitary Association met in St. James's Hall, Derby, to celebrate the tenth anniversary of their institution, under the presidency of the Mayor. The object of this association is two-fold: (1) to train and provide thoroughly educated nurses for the sick poor and for private families; and (2) 'to organise means which shall tend to the prevention and, more or less directly, to the removal of disease.' The report for 1874 gives a sketch of the rise and progress of the institution. It was started in 1865, with a single nurse, whereas it now boasts of a staff of thirty-nine, under active, constant, and careful superintendence. Among the rich the nurses of the institution attended 180 different families in 1874; and having earned 1,185*l.*, this branch of the work was more than self-supporting, 120*l.* being added to the building fund. The charitable subscriptions of the supporters of the institution have enabled four, and sometimes five, district nurses to be constantly engaged in gratuitous attendance upon the sick poor. Upwards of 4,000 pints of beef-tea, and numberless invalid's puddings and dinners were also sent out, in addition to 334 dinners served to poor convalescents at the institution. It is almost impossible to calculate the good that is done in this way among the poor, as, far from the least of these benefits, is the way in which the lower classes thus learn how to help themselves in sickness, and what ought to be done in illness. Both the clergy and the medical men in Derby testify to the excellent management of this nursing institution and to the tact and ability of the lady-superintendent. One of the results of this good management is that the institution is perfectly solvent, although much in need of funds for building a permanent house for the nurses.

The Health of Watering Places.

XIII.—RHYL.

As in the case of Llandudno, the figures for the registration sub-district of St. Asaph, taken to represent Rhyl in the Registrar General's Watering Place Table, are scarcely suitable for the purpose, and their use would frequently lead to erroneous conclusions as to the sanitary condition of this health resort. The sub-district of St. Asaph has an area of nearly 35,000 acres, and had a population of 12,722 persons in 1871, whereas only 4,229 persons were enumerated within the improvement district of Rhyl. The sub-district includes the six parishes of Dymeirchion, Cwm, Dyserth, Meliden, St. Asaph, and Rhuddlan, and the township of Bodfary, which includes but a portion of the parish of that name. The improvement district of Rhyl comprises only a part of the parish of Rhuddlan, in which the population showed an increase of 1,128 persons during the ten years 1861–70, whereas in the other portion of the sub-district the population declined to the extent of 328 in the decade. From the Census Report it appears that the Rhyl improvement district did not exist in 1861, so that it is not possible to state the exact increase of population in the district during the ten years; but it is probably safe to conclude that the whole increase of population in the parish occurred in and around Rhyl, whereas in other parts of Rhuddlan parish the population may be taken to have been stationary at about 1,300 persons throughout the ten years.

The population of the parish of Rhuddlan at the first national census in 1801 was returned at 883 persons, and in 1831 had increased to 1,506; in the next twenty years it had further increased to 3,049. Between 1851 and 1861 the enumerated population rose from 3,049 to 4,397, and in 1871 it had further increased to 5,525. The decennial increase of population in Rhuddlan parish averaged 29 per cent. during the fifty years 1801–51, was equal to 44 per cent. between 1851 and 1861, and to 26 per cent. in the decade 1861–71. Applying the rate of increase which prevailed during the ten years 1861–71 in Rhuddlan parish, to the enumerated population of Rhyl improvement district in 1871, the population of Rhyl may be estimated at 4,555 in the middle of 1874, and at 4,660 in the middle of this year. The population, therefore, of Llandudno and Rhyl may at the present time be taken as nearly equal.

Although, as we have pointed out, the statistics of St. Asaph sub-district do not afford a satisfactory basis for estimating the sanitary condition of Rhyl, it will be useful to glance at the figures relating to the sub-district in recent years, always bearing in mind that the sub-district includes the two parliamentary boroughs of St. Asaph and Rhuddlan, and a considerable rural area and population, as well as the improvement district of Rhyl, which we would wish more particularly to discuss on the present occasion.

During the ten years 1861–70 the annual birth-rate in St. Asaph sub-district averaged 31·4 per 1,000; in the four years 1871-4 it was successively 28·9, 30·8, 25·1, and 26·7. Thus the birth-rate has averaged but 27·9 during the past four years, and has been 3·5 per 1,000 below the average rate in the preceding ten years. This decline in the birth-rate raises the question whether the present population of the sub-district, and consequently of Rhyl, is not somewhat over-estimated. The rate of increase of population between 1861 and 1871 was not so great in the sub-district as it was in the preceding ten years; it is quite possible, therefore, that the rate of increase has still further

declined, in which case the present population would be somewhat over-stated, and the birth and death-rates calculated thereon correspondingly under-stated. The decline in the birth-rate may certainly be taken as conclusive evidence that the present population of Rhyl is not under-estimated, and the effect of a slight over-estimate, should this be the case, would be too small to seriously detract from the value of the mortality figures for the purpose for which we intend to use them. Within the improvement district of Rhyl the birth-rate in 1874 was equal to but 29·2 per 1,000, and but slightly exceeded that in the entire sub-district, which was 26·7.

The annual rate of mortality from all causes in St. Asaph sub-district averaged 21·9 per 1,000 during the ten years 1861–70. As, however, the union workhouse is situated in this sub-district it is necessary to make a correction for the deaths of paupers belonging to other parts of the union, which are there registered. Assuming that half the deaths in the workhouse are of paupers admitted from parishes of the union lying outside the sub-district, the average annual death-rate in the sub-district in the above-mentioned decade is reduced to 21·1 per 1,000. This mode of calculation is of too crude a character to be entirely satisfactory, but failing a special return of the deaths in the workhouse showing the settlement of all the deceased paupers, a more accurate form of correction is not now possible. In the four years 1871–4 the annual death-rate in the sub-district, corrected in the same manner for workhouse deaths not belonging to the sub-district, was 19·6, 21·8, 20·2, and 19·7 per 1,000 respectively; the death-rate in these four years averaged 20·3 per 1,000, and was thus 0·8 per 1,000 below the average rate in the ten preceding years. It may here be noted that the annual death-rate from the seven principal zymotic diseases in the district or union of St. Asaph averaged 3·0 per 1,000 during the ten years 1861-70; in St. Asaph sub-district it was equal to 3·1 in 1871, 3·4 in 1872, 0·8 in 1873, and 2·3 in 1874. During the two years 1871 and 1872, small-pox, scarlet fever, and other forms of fever, were somewhat fatally prevalent in St. Asaph sub-district; in 1873 the sub-district was comparatively free from the fatal prevalence of zymotic disease, whereas in 1874 the deaths referred to measles, scarlet fever, diphtheria, whooping-cough, and diarrhœa, in the aggregate, considerably exceeded the numbers returned in any of the three preceding years.

In our recent examination of the mortality statistics for Llandudno it was found that the inclusion of a considerable rural area in the registration sub-district, taken by the Registrar General to represent that watering place, had the effect of overstating its death-rate. It appeared that the death-rate, both from all causes and from the principal zymotic diseases, was considerably higher in the rural parishes around, than in Llandudno itself. In nearly all similar cases, previously examined, the inclusion of rural population in a sub-district, taken to represent a watering place, favourably affected the death-rate; this appears also to have been the case with Rhyl in 1874. The death-rate during the year in the entire sub-district of St. Asaph, after correction for deaths in the workhouse, was, as above mentioned, equal to 17·7 per 1,000; in the Rhyl improvement district it was, however, so high as 25·2, while in the remainder of the sub-district (including St. Asaph, Rhuddlan, and the rural population of the sub-district) it was but 17·9 per 1,000. The death-rate from the seven principal zymotic diseases in 1874 did not show so wide a variation; it was 2·4 in the entire sub-district, 2·9 in Rhyl, and 2·1 in the sub-district, exclusive of Rhyl. Inasmuch as a town or watering place cannot afford to be indifferent to the sanitary condition of the rural parishes around it, it may not be out of place here to mention that of eighteen deaths referred to the seven principal zymotic diseases in St. Asaph sub-district outside Rhyl, during 1874, seven occurred in the parish of Dyserth, three both in St. Asaph and Cwm, and two both in Rhuddlan and Meliden. As the population of Dyserth parish was only 1,068 persons in 1871, and it has probably not since increased, the death-rate from these zymotic diseases was equal to nearly seven per 1,000 in 1874, against 2·9 in Rhyl. This fact speaks badly of its sanitary condition, which should be investigated by the rural sanitary authority of St. Asaph.

We may now proceed to discuss the principal features of the mortality in Rhyl improvement district during 1874. The 115 deaths from all causes registered within its boundaries, were equal, as before stated, to a rate of 25·2 per 1,000, considerably exceeding the rate which prevailed in any of the twelve other English watering places previously discussed, among which the death-rate ranged from 15·3 and 15·4 in Eastbourne and Ramsgate, to 19·5 and 22·3 in Hastings and Yarmouth. It should be stated that none of the deaths of Rhyl paupers in the union workhouse have been brought into account in calculating this death-rate in 1874, because the deaths registered in the improvement district included two in the Children's Hospital, and one in the Convalescent Institution, which were probably of inmates admitted to those institutions from outside Rhyl. Without any special information on this point it has been assumed that these two disturbing influences balanced each other in 1874. Why the death-rate in Rhyl in 1874 should so far have exceeded the rate in the twelve other watering places can hardly be satisfactorily determined without local investigation, but a careful examination of the Rhyl figures will help to throw some light upon the subject.

The 115 deaths in Rhyl in 1874 included four which were referred to different forms of fever, three to diphtheria, three to diarrhœa, two to scarlatina, one to measles, and not one either to small-pox or whooping cough; in all, thirteen deaths resulted from these seven principal diseases of the zymotic class, equal to 11·3 per cent. of the deaths from all causes, and to a rate of 2·9 per 1,000 persons estimated to be living. Among the twelve English watering places previously referred to, the percentage of deaths from these seven diseases to total deaths in 1874 ranged from 5·6 in Eastbourne to 28·8 in Yarmouth. The zymotic death-rate per 1,000, which was but 0·9 and 1·4 in Eastbourne and Llandudno, ranged upwards to 2·9 and 6·4 in Lowestoft and Yarmouth. Without any zymotic disease being actually epidemic in Rhyl during 1874 the death-rate from the seven principal diseases of this class, within the improvement district, was only exceeded, among the twelve other watering places, in Yarmouth where scarlet fever was fatally prevalent. This accounts for part of the excess of deaths in Rhyl last year.

The following details may be mentioned with reference to the thirteen deaths from zymotic diseases in Rhyl during last year. In the first quarter, one death was referred to diphtheria, and one to nervous fever in Queen Street; in the second quarter a fatal case of bilious fever occurred in Crescent Road, one of simple continued fever at Morfa Bach, and two of scarlet fever at Foryd Hall. During the three months ending September, one death was referred to diphtheria in Sussex Street, and one in Wellington Road; one to gastric fever at Highfield Cottage, one to measles in Morley Villas, and three to diarrhœa in different parts of the town. No death in Rhyl was referred to any of these seven principal zymotic diseases during the last three months of the year. With reference to the mortality from diarrhœa during the third or summer quarter of the year it may be noted, that the three deaths from this disease in Rhyl included two of young children and one of an elderly person, and were equal to an annual rate during the quarter of 2·6 per 1,000. No death was referred to diarrhœa in Eastbourne during the summer quarter of 1874, but in the other watering places dealt with the annual death-rate from this disease during that period ranged from 0·9 and 1·2 in Llandudno and Hastings, to 3·5 and 4·9 in Lowestoft and Margate.

To diseases of the respiratory organs, and to phthisis, fourteen and fifteen deaths were respectively referred in Rhyl during the year 1874; the deaths from the diseases

of the respiratory organs were equal to a rate of 3·1 per 1,000, while the phthisis rate was 3·3. In the other watering places for which we were able to obtain similar figures the death-rate from diseases of the respiratory organs in 1874, ranged from 1·8 per 1,000 in Worthing, to 3·2 in Llandudno and 3·6 in Dover; the Rhyl rate from these diseases, 3·1 per 1,000, was higher than that which prevailed in most of the other watering places. The phthisis death-rate, which was so low as 0·9 and 1·3 in Llandudno and Lowestoft, and ranged upwards to 2·0 and 2·6 in Worthing and Hastings, was so high as 3·3 in Rhyl. The excessive fatality in Rhyl during 1874 from diseases of the respiratory organs and phthisis assists still further to explain the high death-rate from all causes, and suggests the desirability of an inquiry extending over a series of years, which might prove that the result for 1874 was an exceptional one as regards the death-rate from these diseases. In dealing with the mortality statistics of watering places the impossibility of distinguishing in the death-register the deaths of visitors from those of residents always stands in the way of completely investigating facts similar to the high death-rate in Rhyl from diseases of the respiratory organs. Such facts are generally sought to be attributed by the authorities of watering places to the deaths of visitors, but until the death-register shows in addition to the place of death, the usual residence of all deceased persons who die away from home, this interesting question cannot be satisfactorily settled. The usual residence for this purpose would be infinitely more useful than the place of birth, which has been frequently advocated as an addition to the register. With regard to Rhyl there is no reason to believe that the death-rate is exceptionally disturbed by the deaths of visitors, as is the case in Hastings, Ventnor, Torquay, and a few other watering places which have become favourite resorts for phthisical and other invalid visitors.

Infant mortality, measured by the proportion of deaths under one year of age to births registered, was equal to 180 per 1,000 during 1874 within Rhyl improvement district, against 136 in the remainder of St. Asaph sub-district. Infant mortality in England and Wales during 1874 averaged 151 per 1,000, whereas in the twelve other watering places previously referred to, it ranged from ninety-five in Worthing, to 158 in Lowestoft. This excessive mortality among infants in Rhyl affords further presumptive evidence of the unsatisfactory sanitary condition of the town. It may be useful to mention that of the twenty-four deaths of infants, aged under one year, registered in Rhyl during 1874, three were referred to zymotic diseases, two to pneumonia, and no less than sixteen to the indefinite causes returned as convulsions, atrophy or debility.

The enumerated population of St. Asaph sub-district in 1871 contained a proportion of 102·8 per 1,000 of persons aged upwards of sixty years; this proportion is considerably higher than that which prevailed in most of the other watering places. This large proportion of elderly persons is partly due to the situation of the union workhouse within the sub-district. Assuming that the proportion of persons aged upwards of sixty years in Rhyl is now the same as it was in the entire sub-district in 1871, it may be estimated that 468 persons were living at these ages in the middle of 1874 within the improvement district, among whom thirty-seven deaths were registered in the year, equal to a death-rate of 79·1 per 1,000. The average death-rate in the whole of England during 1874 among persons aged upwards of sixty years was 72·0 per 1,000, and in the twelve watering places it ranged from 56·4 in Weymouth, to 67·2 and 70·9 in Worthing and Llandudno, respectively. As we recently pointed out, the high death-rate among elderly persons in Llandudno last year is difficult to account for, because the death-rate among infants, children, and young adults was low. The still higher rate in Rhyl, however, only affords further corroboration of the general high death-rate during 1874 in this watering place. It should be remembered, too, that this high death-rate in Rhyl is probably somewhat understated, as it is doubtful whether the proportion of persons living at the ages over sixty years is so large in Rhyl as in the entire sub-district, because the workhouse is situated outside the improvement district, and, moreover, some of the nine deaths in the workhouse during 1874, of paupers aged over sixty years, had probably been admitted from Rhyl. At any rate there can be no question as to the excessive rate of mortality among elderly persons during 1874 in Rhyl, and there is little chance of this being to any considerable extent due to the deaths of visitors.

A short reference to the figures published in the Registrar General's first two Quarterly Returns for 1875, will be necessary in order to complete this examination of the recent mortality statistics of Rhyl. During the six months ending June 30 last, 170 deaths were registered in St. Asaph sub-district, which exceeded by twenty-five the average number in the corresponding period of the three preceding years, and were equal to an annual rate of 26·2 per 1,000. We have not the means, at present, to ascertain the respective death-rates in the Rhyl improvement district, and in the other parts of the sub-district; if, however, these rates bore the same proportion to each other as they did during 1874, the Rhyl death-rate in the first half of this year must have exceeded the rate of 30 per 1,000. To the seven principal zymotic diseases seven deaths were referred in the sub-district during the six months, which were equal to an annual rate of but 1·1 per 1,000, showing a considerable decline from the zymotic rate in 1874. These seven deaths included three fatal cases of enteric fever in Rhyl, and two of scarlet fever in Meliden parish, during the March quarter; and one each of scarlet fever and enteric fever in Rhuddlan and Dyserth, respectively during the three months ending June last.

Having thus completed our critical examination of the recent mortality statistics of Rhyl, with a view to estimate its sanitary condition, no other conclusion can well be arrived at than one which is eminently unsatisfactory. Whether we look at the death-rate from all causes, or from zymotic diseases, or diseases of the respiratory organs, or phthisis, we find a markedly excessive mortality in 1874, which was to a great extent maintained during the first half of 1875. Infant mortality and the death-rate among elderly persons confirm the charge that a considerable waste of life is now taking place in Rhyl. An examination of the vital statistics of Rhyl, extended over a series of years, might show that the results for 1874 were somewhat exceptional; but, on the other hand, a thorough local investigation of the sanitary condition of the town and inhabitants would more probably afford a complete explanation of the excessive mortality. We believe that the improvement commissioners—the urban sanitary authority of Rhyl—have recently appointed a new medical officer of health (the last had the magnificent salary of 20*l.* per annum), and it may be hoped that sanitary matters in Rhyl will now receive increased attention, for which the foregoing figures furnish an urgent plea. In this series of articles we have, as far as possible, avoided invidious comparisons, and have principally confined ourselves to a statement of facts. In the case of Rhyl, however, we will ask its sanitary authority, and indeed all those interested in its welfare, to ponder seriously on the fact that in 1874 the town death-rate exceeded by 47 per cent. that in Llandudno, and by 39 per cent. the average rate in the twelve other English watering places, during the same year. This result, moreover, occurred without the epidemic prevalence of any zymotic disease. The water-supply is said to be not only abundant and of excellent quality, but delivered on the constant system. The sanitary defects of the town, which are suggested by the foregoing examination of its mortality statistics, will therefore probably be found to exist principally in the drainage system, which it is proposed to improve during the coming winter. The condition of the houses inhabited by the working classes should also be critically examined, as this has an important bearing upon the death-rate of a town. The sanitary authority of the town is, moreover, now unprovided with hospital accommodation for the isolation and

treatment of cases of infectious diseases; this is also a matter which deserves the serious consideration of those interested in the welfare and sanitary reputation of Rhyl.

Built on a low flat slip of land, Rhyl has no natural beauty to commend it, but is a large comfortable place offering good lodgings and good bathing, along with its fresh sea-air to those who seek the sea-side for its own sake only. It is far less expensive than its neighbour, Llandudno. The sands are extensive and shelve very gradually. The sea-bathing arrangements are excellent, and there are no fewer than four bathing establishments.

Many of the usual recreations of watering places are to be found here; there is a great variety of churches and of chapels: on the whole it is a dull place.

The climate is much the same as that of Llandudno, but there is no protection from the north-west. A large convalescent hospital has been established here, which contains fifty-six beds, and is well managed.

Rhyl is within one hour and a-half of Liverpool by steamer. There are not many objects of interest in the immediate neighbourhood. One of the nearest is Rhuddlan Castle, three miles off. Six miles distant is St. Asaph, with its cathedral, well worthy of a visit. We need not describe the Cefn rocks, with their fine view, and the caves in the limestone, but may be excused for mentioning Ffynon Fair, St. Mary's Well, one of the numerous holy wells in Wales. They consist generally simply of pure water, and many extraordinary cures have been worked at them, though they are less frequent in these incredulous days. Llandudno too has its holy well of St. Trillo, and indeed the well of St. Asaph, near Dyserth, is nearly as holy, although it does not bring forth quite so astounding an amount of water as the well of St. Winifred, the holy well of Flintshire, the neighbouring county, which is probably the most copious spring in England. Most people go and visit the elegant Henry the Seventh's structure erected over it, and cannot fail to admire a work of art which is unique of its kind. The wonderful cures effected in old days there, and at dozens of other wells, including Malvern, Willow Bridge, and Knaresborough, if not miraculous, are a standing testimony to the value of cold-water bathing.

As Sir John Floyer wrote: 'Many of our English springs will do miraculous cures when used in cold bathing, which in ages more illiterate were imputed to the virtue of the saint to whom they were dedicated, or to the devotions used there. Parents used always at the baptism of their children to desire the priest to dip that part very well in which any disease used to afflict themselves, to prevent its being hereditary.' However, at most English wells, as at Holywell, St. Mungo's, Willowbridge, and other places, our ancestors were not satisfied with simple immersion, but practised extensively what is the keystone of the modern water-cure. 'The way of sweating by cold water was sometimes practised by our country gentlemen who loved horse-races, to abate the weight of the rider. Dip the rider's shirt in cold water, and, after it is put on very wet, lap the person in warm blankets to sweat him violently, and he will after lose a pound or two. Others content themselves with dipping only the child's shirt and night-cap in water, and put them on wet on him.' But when there was total immersion, 'the children, as soon as they were dipped, were, with their wet clothes on, wrapt up in blankets and put immediately to bed, which instantly puts them into a violent sweat.'

It is thus plain that in those days they had at least a very good notion of the practice, if not of the principles of hydropathy. Of all the places where the cold-water bathing in holy wells was practised successfully, Malvern alone—where, indeed, Dr. Wall anticipated modern water dressings, and much of Hebra's treatment of skin-diseases with moist applications—has become popular as the seat of water cures. Of bathing after the old fashion, there is now only a little at Holywell, and very rarely at some other Welsh wells. The Welsh Baptists do, indeed, still practice total immersion in a way that would, in spite of its not being quite orthodox, have delighted the heart of old Sir John Floyer, for he thought that 'the laudable old custom of entire immersion in baptism would have saved many hereditary diseases, if still practised.' And here we would venture on a hint for modern hagiolaters; in these days, when we hear less of cures by Mesmerism, why should we not have a revival of the honest miracle well-cures? If the waters of Lourdes (the seat of the recent miracle in France), when bottled, sealed, and exported, work cures, why should not our holy waters do the same? Why should not the two patron saints, male and female, of our English wells—St. Chad and St. Anne—be rehabilitated? We may live to see more improbable things come to pass.

Correspondence.

SCARLET FEVER AT HURDSFIELD.

(*To the Editor of the* SANITARY RECORD.)

SIR,—In a recent article in the SANITARY RECORD you allude to my refusal to close one of the schools of this parish.

If the premises upon which you base your remarks were true, I should be one of the first to unite with you in your disapproval of my conduct as chairman of the schools committee.

But I think you will see from the Macclesfield Board of Health meeting, and from the leading articles of the only three newspapers published in this town—all of different shades in politics—and from the correspondence which has arisen out of this outbreak of fever, as well as from the memorial of the ratepayers of the township of Hurdsfield, that there are two sides to the question.

You will see that the seventeen cases of scarlet fever in the schools are reduced to thirteen, according to the medical officer of health's own new version; that this smaller number is not very remarkable when it is taken into account that the school is the only school of the district; that the township has been most culpably neglected for a quarter of a century by the public authorities; and that the sanitary condition of the parish is so bad, that twelve out of the fifteen medical men in the town consider children safer in the school than out of it.

Surely you will draw a moral from all this, and not allow the odium to rest entirely on

Your very obedient servant
CHARLES HANDCOCK.

Hurdsfield Vicarage, Macclesfield,
September 4, 1875.

[We refrain from entering fully into the whole of the correspondence and reports of discussions which have taken place anent the sanitation of Hurdsfield. It appears, however, that at one time a great deal of unnecessary warmth was imported into the consideration of questions which should be above the reach of personal or party feeling. There can be little doubt but that the epidemic is the result of long continued sanitary neglect on the part of the authorities. Yet when it had appeared amongst the children, a prompt closing of the school would have been a measure of wise precaution, both in a legal and medical sense.]

THE WATER-SUPPLY OF LEAMINGTON.

(*To the Editor of the* SANITARY RECORD.)

SIR,—I find in the SANITARY RECORD of this day a review of an old and almost forgotten pamphlet of mine on the water-supply of Leamington. It was written more than a year since, and has, as far as it went, fulfilled its purpose. Its object was to allay any panic in case of the failure of the proposed artesian well, and to show that the river water supply, indifferent and imperfectly filtered as it was shown to be, was better and safer than the surface

wells in the town, which, though clear and bright, were largely polluted with sewage and slops. A short time previously, a death from typhoid had occurred in the case of a patient who did not drink the town water; this was made a peg to hang a tale of polluted water-supply upon by the local press of rival watering places, and did much damage to our town, one, at least, of these rival towns having a far worse water-supply. My reason for now addressing you is that it would seem by your review that my pamphlet was a recent production, and that we were still in doubt about the success of the artesian well. This is not the case; the well is a shaft of eight feet diameter, seventy feet deep, which is to be continued another ten feet as soon as pumps of a sufficient size can be fixed to keep down the enormous amount of water, the difficulty of keeping down this water having seriously impeded the progress of the work. Below this shaft is a bore hole of eighteen inches diameter for thirty feet, and twelve inches for a further hundred feet. This bore-hole is now plugged to keep the lower water out. The upper fifty feet of the shaft is bricked and puddled to keep out the surface water, whilst from the remaining twenty feet 300,000 gallons of water a day are being pumped; this is daily gauged by the town surveyor. The engineers are satisfied that when the work is complete and the plug removed from the bore-hole there will be a supply of at least 1,000,000 gallons per twenty-four hours. Last February I made an analysis of this water, when I found the total solids twenty grains, chlorine 1·3 per gallon, temporary hardness 5·5, and remanent 6·5 of Clark's test, with free ammonia ·00 and albuminoid ·02 per million parts: so that I think we shall be free from all panics or doubt of the purity of our water-supply. It is calculated that this may be laid on to the houses in about six months.

I have not made any later analysis, as the oil and grease of the machinery inseparable from the works would invalidate the results.

HORACE SWETE, M.D.
Medical Officer of Health,
Droitwood Sanitary Districts.

5 Newbold Terrace, Leamington.
September 4, 1875.

Reviews.

The Local Government of London. By J. T. DEXTER. London, Edward Stanford, Charing Cross.

MR. DEXTER'S pamphlet on the Local Government of London is chiefly occupied with fault finding. It is true that he gives praise to some vestries and boards, and also to a few well-known medical officers of health and vestry clerks, but the bulk of his remarks apply to the legal shortcomings of the various Acts under which the metropolis is governed, and the ministerial incapacities, to say the least of it, of the men who have been selected to carry out the duties entrusted to them.

It is true that the Local Government of London is in a disgraceful state as regards its laws. Mr. Dexter says truly, 'Who will say that the Government of London is one which the powers that be are anxious that mortal man should ever comprehend? More complex than the most complicated of Chinese puzzles, well has it been asserted in the language of one of its most astute legal administrators, "Fearfully and wonderfully are we made, and still more wonderfully are we governed."'

The statements which led up to this quotation certainly bear out all that is said. For instance, he points out that jurisdictions of the Metropolitan Police Courts do not correspond with those of the Metropolitan Board of Works. That the powers of the latter extend in one direction as far as Woolwich, and yet does not include a piece of South Hornsey which lies between Hackney and Stoke Newington. That the poor law districts in many instances differ from those of the vestries and local boards. That different districts interlace one another in a most capricious manner. That the elections of the various governing boards differ so that what is a legal vote for one election is illegal if given in the same way at another election for a different body. Thus guardians are elected by placing your initials on a paper at your own house, whilst the election for members of school board and vestries is carried on at a place selected for the purpose, by balloting papers, which, if marked with your initials are void. Again, one-third of the members of vestries go out every year, but all the members of the school board go out together every three years. That the members of local boards are elected by the vestries and not by the parishioners, and the members of the Metropolitan Board of Works by the vestries or local boards, some vestries having two members, others one, and others only part of a representative at that board which spends so large a proportion of their rates. Again, in some districts the qualification for a vestryman is a rating of 25*l.* per annum, in others one of 40*l.* A vestryman must have been a parishioner for at least twelve months, whilst a member of a board can be elected directly he has been placed on the rate books. In one district the trustees of the poor are self-elected, and elected for life provided they attend a given number of times in each year, in others they are elected by the vestry. We could go on much longer but think this is sufficient for our purpose.

Mr. Dexter gives some astounding statistics as to the number of persons employed in the government of London. He says there are 2,600 members of local boards, 805 members of boards of guardians, other rating authorities consisting of 632 members, 700 justices, 350 churchwardens, and 640 overseers. There are employed, 30 accountants, 240 chief clerks (is not this a mistake?), and 12 solicitors. There are 48 medical officers of health, 18 food analysts, 3 architects, 3 engineers, 112 surveyors, 110 inspectors of nuisances, pavements, cattle, etc., besides the large number of officials appointed by the various guardian boards. As chief clerks are not mentioned amongst these, it is probable that they are included under the above-named 240.

On considering these figures we can only conclude that there is a sufficient number of officials employed and to spare for the proper government of London, provided the law were simplified, the central authority in each locality unified, the boundaries of the districts rearranged or extended, and one central authority presiding over all, not autocratically, but with sufficient power to compel uniform action throughout the metropolis. This might readily be done by leaving the control of the City of London as it is at present, by making each parliamentary borough a unit of administration, by increasing the number of the Metropolitan Board of Works, and by making their election direct by the inhabitants, instead of by the vestries or district boards. If this were done, a much better class of men would offer themselves for election, as their office and importance would be magnified.

The only body which obtains Mr. Dexter's unqualified praise is the District Asylum Board, as he says 'that whatever criticisms have been and may yet be fairly made upon particular acts, has proved itself one of the few capable, energetic, efficient bodies connected with the local government of London.' He objects to the Metropolitan Board of Works, because they appointed their architect to superintend the Baby Farming Act, and gives them no praise, except indirectly, for the magnificent works they have carried out. He severely criticises (p. 16) the Local Government Board for appointing 'a batch of fledgling barristers as inspectors, to put into operation the sanitary clauses of the Public Health Act, 1872.' He believes (p. 32) 'that the Local Government Board seeks to cure pauperism by providing for it upon a scale that seems to forecast the extinction of independence in the lower orders,' and that the Poor Laws must eventually break down under the burden which has been cast upon them. At page 53 he says: 'Government by vestries has failed in much, and centralisation through the Local Government Board has

been one long series of administrative blunders, enmeshing all that it has meddled with in haze and confusion. That board is an engine, the motive power of which is hot or cold, as suits the caprice of some dominant member of the permanent staff.'

We must now conclude this article, and regret to be under the necessity of stating our agreement in his opinion of the results of the work of the Local Government Board. That board, whenever it has meddled with sanitary matters, has always muddled, and apparently will always do so until those who really exercise the motive power are removed by Act of Parliament, death, or old age.

A Paper on Ventilation with Apparatus. By GEORGE GOLDIE, ESQ., M.D., Medical Officer of Health, Leeds, 1875.

House Ventilation and Warming. Westminster Review, July, 1875.

DR. GOLDIE'S paper, first of all, briefly points out the great necessity which exists for improving the ventilation of the dwellings of the labouring classes and, as well, of those of the middle and upper classes. He takes also considerable pains to point out that ordinary cottage property deserves as much attention as any other. The cottages in Leeds, his own district, are mainly of the back-to-back kind, with kitchens under ground, and it is a constant inspection of these badly constructed and improperly arranged places, that led him to give especial attention to this subject.

In the matter of low rented cottages, which must always obtain, Dr. Goldie cannot well see how they can, as at present existing, be both warmed and heating simultaneously. But we are, nevertheless, quite sure that if the houses of this class were razed to the ground he would be certain to find out a plan which would allow these functions to be performed; and it strikes us that it would be an easy matter to erect a furnace at the end of each row or terrace, and lay the hot air on to each tenement. Taking the cottages as they are, however, and considering only the question of providing them with fresh cold air, Dr. Goldie recommends the following admirable and inexpensive plan, which we have ourselves seen tried with wonderfully good results. The lower sash of the window is raised up a distance of five or six inches from the bottom of the window, and a board placed where the bottom rail of the lower sash was so that the lower sash will be able to rest upon it. The top rail of the bottom sash therefore, passes a few inches above the bottom rail of the upper sash, and through this interstice a steady flow of cold air is kept up. The outlet of foul air would naturally be into Arnott's valves, fixed in the flue at ceiling height, finding proper openings in specially constructed vitiated air-flues. There can be no doubt that this system would be a boon to thousands of cottagers who cook, wash and live in one apartment, and trundle to bed in adjacent rooms where there is neither a circulation nor a renewal of the air. But this homely manner of admitting air into the room is, after all, more fit for the upper rooms than for the ground-floor ones. In rows of houses, shutters are mostly used, and where there none, how are the sashes to be fastened, since an ordinary sash fastener would be now useless? In the matter of fresh-air inlets Dr. Goldie recommends the 'air to be brought in by means of air-bricked openings, about a foot or so below the ceiling, by which means the sudden rush of cold air would be avoided. He does not, however, mean that the outlets for foul air and the inlets for fresh air need both to be at the top of the room. He merely suggests what might be done under varying circumstances.

The bulk of Dr. Goldie's paper is, however, taken up by an explanation of a system of combined warming and ventilating which he has seen used at Leeds Exhibition, at the house of the patentee, and also at several workshops. It is claimed for this, the latest scheme, that with the very minimum of fuel and attention it will automatically supply a continuity of pure warmed air both day and night, that it is free from any chance of explosion, not liable to leak or become inoperative from frost, and that either hot water or steam can be made the heating medium. When not used for conveying heated air it will, of course, be conveying pure cold air. It consists of a series of hollow copper vessels, standing erect side by side a few inches apart, the whole being boxed in, and standing in the hall or room, not unlike an old-fashioned eight-day clock. The copper vessels are filled with hot water from a circulating cistern, and the cold air passes from the outside of the house between the floor joists to the underside of the casing, then finds its way up between the warm copper plates and is discharged in a heated condition at the top of the apparatus. Dr. Goldie assures his readers that no stifling effects are produced, it being impossible to overheat the air. He also states that it will exchange the whole of the air in the house at least once during the hour, and sometimes twice and thrice. The system is, of course, in no way novel, beyond the fact that here is a new way of applying such system. And having inspected the apparatus ourselves, we are bound to acknowledge that Dr. Goldie is not overstating matters when he says that these contrivances are alike applicable for cottage, mansion, or public building. At the same time, as far as results go, similar ones are daily achieved by some of the ventilating grates and stoves which heat the air by convection. The serviceableness of the Leeds patent lies in its handiness and in its adaptability to the hot-water systems.

The article in the *Westminster Review* is an able one, written in the best style, and should draw the attention of the upper classes to many sins of omission and commission in the sanitary law which prevail even in their highly fitted-up domiciles. The salient facts of the subject are also well set forth. It shows that the proper renewal of the air in a room is not wisely measured by the quantity passed through the lungs in a given time, but that perfection and thorough salubrity means 'the removal and renovation of the whole of the tainted portion as fast as it becomes tainted.' According to Dr. Dalton, the average respiration of a man is twenty-four cubic inches, the average number of respirations twenty, and 400 cubic feet pass through the lungs in twenty-four hours.

The fallacy, as the writer points out, lies in the assumption that a supply of 400 cubic feet to the room every twenty-four hours would ensure health, the fact being that a man will taint by mixture, just as poison will a fluid, some 17,500 cubic feet of air during the day. Respiration, it is also shown, not only robs the imbibed twenty-four cubic inches of a certain portion of its oxygen, but mixes it with a quantity of carbonic acid and vapour, the second respiration in a stagnant atmosphere beginning the process of blood-poisoning. This being so, perfect ventilation must remove the whole stratum of air tainted by each respiration, --must, in fact, effect a removal of such tainted air twenty times per minute. The expired air rises in part, being rarefied by heat, and in part falls, as carbonic acid, and the twenty-four inches thus spread may be assumed to taint a stratum of air of about eighteen inches at or about the mouth of the occupant. 'Any lateral movement, would, in the case of several occupants, simply sweep the air breathed by one person close by the lips of some other, and hence, we hold, as a corollary to this rule, that the prescribed movement should be either up or down, not lateral.'

The whole of the article is similarly well treated, and as may be supposed, the writer advocates the heating of the pure fresh air as it enters through a grid or other contrivance by means of a slow combustion or other stove. Happily these appliances are easily obtainable, and we need not pay through the teeth for some patent, which alone can ensure the necessary boon.

MR. S. ROYCE, in a recent address before the New York Libera Club, said that as many persons die every year of consumption among the poor as die of all other diseases among the wealthy. The annual death-rate among the labouring classes is, he said, fifty-five to every 1,000, while among the wealthy and well-to-do population the death-rate is only fifteen in 1,000.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

ATTWATER, Arthur William, L.R.C.P. Edin., M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Whickham Urban Sanitary District.

FENTON, Robert Esq., has been appointed Chairman of the Castleton-by-Rochdale Urban Sanitary Authority.

GILL, John Beadnell, M.D. Univ. St. And., M.R.C.P. Edin., M.R.C.S. Eng., L.S.A., Lond., has been appointed Medical Officer of Health for the Sandgate Urban Sanitary District, vice Howard, resigned.

GRIFFITHS, John Thomas, L.R.C.P. Edin., L.F.P.S. Glasg., has been appointed Medical Officer of Health for the Llandwrog Sub-District of the Carnarvon Rural Sanitary District, vice Williams, resigned.

LAWRIE, Mr. James, has been appointed Surveyor and Inspector of Nuisances for the Berwick-upon-Tweed Urban Sanitary District for two years, vice Mitchell, resigned.

ROYDS, Clement, Esq., has been appointed Treasurer to the Castleton-by-Rochdale Urban Sanitary Authority.

SHEPARD, Mr. J. A., has been appointed Clerk to the Rhymney Urban Sanitary Authority.

SOPPIT, Mr. James, has been appointed Inspector of Nuisances for the Shaftesbury Rural Sanitary District.

THOMAS, George Danford Phillips, M.R.C.S. Eng., has been appointed Medical Officer of Health for the Willesden Urban Sanitary District.

WOLSTENHOLME, Mr. James, has been appointed Surveyor, Inspector of Nuisances and Collector to the Castleton-by-Rochdale Urban Sanitary Authority.

VACANCIES.

BANBURY RURAL SANITARY DISTRICT. Inspector of Nuisances: for the Chalcombe, etc., District; 15*l.* for one year. Application, 14th instant, to W. W. Heming, Clerk to the Authority.

BURTON-ON-TRENT URBAN SANITARY DISTRICT. Medical Officer of Health.

CLAY LANE URBAN SANITARY AUTHORITY. Clerk. Application, October 1, to Mr. Mycroft, Clerk *pro tem.*, Clay Cross.

NETHER-THONG URBAN SANITARY AUTHORITY. Surveyor.

REIGATE. Assistant Surveyor to the Corporation and Urban Sanitary Authority: 100*l.* per annum. Application, 14th instant, to C. J. Grece, Town Clerk.

SAMFORD RURAL SANITARY DISTRICT. Inspector of Nuisances: 60*l.* per annum. Application, 17th instant, to Thomas Kemp, Clerk to the Authority, Ipswich.

WITHAM URBAN SANITARY DISTRICT. Collector. Application, 24th instant, to J. Howell Blood, Clerk to the Authority.

SANITARY PATENTS.

2972. Treating vegetable and animal refuse and sewage. Daniel Wilks, Bloxwich.

2340. Self-acting universal ventilator. Middlemost Wawn and Francis William Willcox, Sunderland.

2621. Neutralising and deodorising poisonous and noxious gases. David Gill, Weston-super-Mare.

2675. Improvements in the treatment of sewage, and in the manufacture of manure therefrom. John Hanson, Savile Town, near Dewsbury, Yorkshire.

ABSTRACTS OF SPECIFICATIONS.

445. Bread. J. H. Johnson, Lincoln's Inn Fields.—A communication from T. C. M. Huyttens, Gand.

This invention has for its object the production of bread at a cheap rate, which whilst equal in nutritive power and flavour to the higher priced best bread, shall be capable of preserving its freshness for a much longer period than the same. In order to effect these objects it is proposed to employ the following ingredients in about the undermentioned proportions, viz.: For bread of the first quality, wheaten flour, say about 100 parts by weight; potatoes peeled and passed through a sieve, 75 ditto; salt, 1·5 ditto; yeast, 1·5 ditto; milk in the proportion of about one gallon to every half hundredweight of the other ingredients. For 'seconds,' wheaten flour (not bolted), say about 100 parts by weight; potatoes (not peeled nor passed through a sieve), 50 ditto; salt, 1·5 ditto; yeast, 1·5 ditto; water in the proportion of about five quarts to every half hundredweight of the other ingredients. The operation of making the bread from the before-mentioned ingredients may be carried out in the manner usual in the manufacture of ordinary wheaten bread.

492. Solid and liquid disinfectants and deodorisers. H. L. Jones Ely Place, Holborn.

This invention relates to disinfecting powers and solutions, and consists in a combination or mixture of mineral sulphates and chlorides of the earthy salts, especially the combination of sulphate of zinc with chloride of sodium or of calcium. The salts are powdered and mixed in the proportions of 10 per cent. of sulphate of zinc to 90 per cent. of chloride of calcium. For liquid disinfectants this same powder is dissolved in water in the proportion of one pound of the powder to each gallon of water, and it is coloured by the addition of a small quantity of aniline blue.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer—not necessarily for publication.

RELATIVE VALUES OF BEET FERTILISERS.

IN a recent impression of the *Sucrerie Indigène*, vol. ix. no. 16, an account is given of experiments made with different fertilisers in the Pas-de-Calais. The composition of the fertilisers used, the distance between the beets, etc., and the yield of beets and percentage of sugar in them, are given in tabular form, with comments and conclusions.

INCOMBUSTIBLE TEXTILE FABRICS.

IT is well known that certain substances, notably phosphate of ammonia, incorporated in the fibres of tissues, render the same incombustible, or, rather, admits of their burning very slowly and carbonising without the production of flame. M. L'Abbé Mauran, says *La Nature*, has recently discovered that a mixture of borax, sulphate of soda, and boracic acid, in suitable proportions, while rendering cloth uninflammable, will also prevent any alteration of colour, flexibility, or lasting qualities through the effect of combustion.

EXCESSIVE SMOKING IN ITS EFFECT ON LIFE.

Some experiments on the composition of tobacco smoke, with special reference to the relative proportions of carbonic acid and carbonic oxide, have been made by Dr. Otto Krause, of Annaberg, and published in Dingler's *Polytechnisches Journal*. His results show that the smoke invariably contains a considerable proportion of the very poisonous gas, carbonic oxide; every 100 volumes of smoke containing on an average 9·3 volumes of carbonic oxide and 12·2 of carbonic acid. As a smoker never expels all his smoke, but must absorb more or less of it by means of his lungs, it is clear that the evil effects of so deleterious a gas as carbonic oxide are not to be overlooked; and, indeed, it seems likely that some of the evils usually attributed to nicotine may, with more fairness, be credited to this highly poisonous gas.

FEVER: CAUTION AND PROTECTION.

THE following precautions have been widely circulated by the Chesterfield Rural Sanitary Authority, and form a model of simplicity and comprehensiveness.

As fever is prevalent throughout the rural sanitary district at the present time, the rural sanitary authority consider it advisable to caution and advise the public against certain acts and conditions which may possibly spread, prolong, and intensify the same, and also recommend others which may modify, if not prevent, an attack.

1. That all slop and foul water be dropped into the drain provided for that purpose, and nowhere else, and after this notice, if any person is found throwing the same into the ashpit or yard, the penalty incurred by so doing will be strictly enforced in every case.

2. That the occupier of every house where fever may appear shall immediately communicate the fact to the medical officer of health, or the inspector of nuisances, so that disinfectants may be supplied, and any insanitary conditions speedily altered.

3. That every precaution should be adopted to prevent contact with the sick, except by the attendants, and that visits from friends and neighbours be strictly prohibited.

4. That thorough cleanliness in the way of lime-washing compartments be carefully carried out, and that all accumulations of rubbish, filth, or manure, in close proximity to human habitations, be quickly removed, and all cesspools, or any stagnant pool of water, near to dwelling-houses, be abolished forthwith.

5. That all sink pipes be effectually trapped, to prevent any ingress of offensive odour or smell into houses.

6. That no water from wells liable to pollution be used for cooking or drinking purposes, without it being first boiled and then filtered, if possible, through a charcoal filter.

By order.
ANGUS MACKINTOSH, M.D.
Medical Officer of Health.

Communications have been received from:

Mr. Joseph Newton, C.E., Balham; Mr. G. Humphries, Hull; the Secretary of the Dublin Sanitary Association; Pearse, Lever & Co., London; Dr. James Rogers, medical officer of health, Swansea; Mr. J. W. Wigner, F.C.S., London; Messrs. Hogg & Co., London; Mr. W. L. Lang, London; Dr. Horace Swete, Leamington; the Rev. C. Handcock, Macclesfield; Dr. Alfred Carpenter, Croydon; Mr. G. F. Heath, Paignton; Mr. John Shepard, Tredegar; Dr. John Beddoe, Clifton; Mr. J. C. Melliss, C.E., Coventry.

NOTICE.

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Original Papers.

REPORT OF THE CHOLERA-COMMISSION OF THE GERMAN EMPIRE. BY PROFESSOR VON PETTENKOFER.*

BY THOS. WHITESIDE HIME, A.B., M.B., &c.,
Sheffield.

THE value of this report cannot well be overrated. Cholera, like all epidemics, presents great difficulties to any one investigating the details of its progress; and hence the extraordinary conflict of opinion at present existing with regard even to such questions as its contagiousness, mode of transportation, and others, which are apparently so simple, and are necessarily brought under every one's notice when cholera is prevalent. In the epidemic of Laufen we have the history of a violent explosion of cholera occurring among several hundred individuals living to a great extent isolated from the surrounding population, under the most similar conditions, and subject to the most rigid surveillance. Thus every circumstance of their life at the time was accurately known, what they eat and drank, where they spent their hours of sleeping and waking, their previous history; in a word, all those details were known which constitute the almost insuperable difficulties of investigating an outbreak of an epidemic.

The epidemic at Laufen is the most violent which ever occurred in Europe, and perhaps, excepting the outbreak at the King's County Prison, New York, in 1866, there is none on record comparable to it.

The report is drawn up by the president of the commission, Professor Von Pettenkofer, at the request of the other commissioners, and exhibits all the acumen and power of analysis for which he is distinguished.

Laufen is a town of 2,100 inhabitants, situated on a tongue of land washed on two sides by the swiftly flowing river Salzach. The soil consists (from above downwards) of, firstly, a layer of sand of varying thickness, next of gravel composed of Alpine limestone, next of a thin layer of conglomerate (Hurt). Beneath lie more sand and gravel, succeeded by another layer of stone (Hurt). The geological structure is everywhere the same, the relative thickness of the strata alone differing. The wells are not merely the river-water which has filtered through the soil.

The prison, in which the epidemic occurred, lies 14·826 mètres above the average height of the river Salzach, and in the higher part of the town. The east side is washed by the stream, the bank of which rises perpendicularly to the prison wall. The prison is a patched-up hunting schloss. The cellars are used for storage. On the north, the ground-floor is skirted by the street, and contains the hospital, chapel, and smithy; the south, with part of the west and east, are occupied by the administration, the remainder of the east, consisting of cells, and of the west, forming the watch-house. The upper stories consist of dormitories, work-rooms, and stores.

The *dejecta* are received partly in stools, partly in closets. There are two or three of the latter on each storey, the shafts being ventilated by a pipe, 0·2 mètre in diameter, opening above the roof. The drainage is naturally to the river on the east side, and this side was the chief focus of the disease. The cesspools are built of brick, and cemented, and so arranged that the main bulk of the fluid is separated from the solid excrement. The fluid is drawn off weekly by an exhaustive apparatus, and the solid is carted away every six or eight weeks, and used to manure the prison farm.

Origin and Outbreak of the Epidemic.

The disease might, of course, have been introduced from any of those places where cholera existed, and which were in direct or indirect communication with it. It seems most probable, however, that it was imported from Munich, as there was more active intercourse with that city than with any other place where cholera existed. Another noticeable fact is that all the convict establishments in Bavaria escaped cholera, except those which received their prisoners from Munich directly. That city was visited by two epidemics in 1873, one in summer (June 25 till October), and one in winter (November 15 till April, 1874); but although many convicts were sent to Laufen during the former epidemic, no ill-effects were produced. There were some few cases of diarrhœa and cholerine, but not more than usual at the season, even when cholera was not in the country, and it was not until after the outbreak of the winter epidemic in Munich that Laufen suffered, cholera breaking out thereand in four other convict establishments almost simultaneously with the winter epidemic at Munich. Independently of the cholera there prevailed greater mortality and morbility at Laufen in 1873 than for ten years previously, the gastric affections in November preceding the epidemic far exceeding those in 1872.

If the cholera then was imported from Munich, it is interesting to know how the prisons there fared, which must have been the home, for a time, of the importer of the disease into Laufen. Strange to say they too all escaped the summer epidemic, except the military prison, which also suffered from the winter epidemic along with the civil ones. The police lock-up at Munich, in which hundreds of prisoners were from time to time confined, had not a single case, and the large prison in the Au suburb also escaped, although during the epidemic there were a number of prisoners transferred to it. Another remarkable circumstance connected with the Munich epidemic deserves notice. Houses and lodgings in Munich are usually engaged by the half year, terminating April 24 and September 29. The latter date in 1873 was during the epidemic, and consequently with the necessary change of quarters there was every reason to fear a great extension of the epidemic. Some would fly the affected parts of the town and seek protection in quarters still unvisited, while others would be obliged unwillingly to remove to districts in which the cholera already prevailed. Some 5,000 families changed quarters, numbering at least 15,000 persons, and yet so far from spreading, the epidemic actually began to decline from that date, and shortly died out.

When the epidemic broke out there were 522

* 'Berichte der Cholera-Kommission für das Deutsche Reich: die Cholera-Epidemie in der K. b. Gefangenanstalt, Laufen.'

prisoners, of whom 125 were attacked, and eighty-three died.

56·7 per cent. had cholera, cholerine, or diarrhœa.
24·5 ,, ,, cholera.
8·2 ,, ,, cholerine.
23·9 ,, ,, diarrhœa.
15·9 ,, ,, died (= 66 per cent. of attacks.)

If the fresh arrivals, who entered the prison subsequent to November 1, imported the cholera and infected the the prison, one would expect that they themselves would suffer severely. This, however, was not so, and the majority of cases of diarrhœa which occurred before the epidemic was among the older residents. But those who arrived during the two weeks preceding the epidemic suffered more than those who were admitted during its progress. Those who had diarrhœa before the cholera began did not suffer from cholera more than those who had not, so that the diarrhœa cannot, as is usually done, be regarded as pathognomonic or essential. A fact quite similar to the above, regarding the new arrivals, occurred in the case of thirty-four prisoners who were in solitary confinement in a detached building until the violence of the epidemic necessitated more space being devoted to the sick. These thirty-four, among whom not a case had previously occurred, were placed among the cholera-smitten prisoners at the height of the epidemic, and their cells were turned into sick wards. How did they fare? Two only took cholera,* one fatally. There was, further, among them one case of cholerine, and eleven mild cases of diarrhœa, only one of which had to be admitted into hospital. The fatal case lasted only fifteen hours, unless it be supposed that he was infected before he was removed from the solitary cells, which is improbable. The greater comparative protection enjoyed by these thirty-four transferred prisoners might be attributed to their being mostly young, from eighteen to twenty-two, but how little age is a protection when certain localities are in question will appear in the sequel.

No thread of evidence connects the first sufferer, a stout young man aged twenty-two, with any known source of infection. He had been eight months in prison, and consequently could only have been infected by imported poison, unless the disease was of spontaneous origin, which would be contrary to what is known to be its character elsewhere. He was attacked November 29. Next day another prisoner, aged thirty-one, was attacked, who had been one year in confinement. On the following day, December 1, there were six cases of cholera and one of cholerine.

All the first serious cases of cholera and cholerine were persons who either worked or slept in the east side, or were in hospital (north side), and during the whole epidemic the most victims came from these parts.

Influence of Occupation.

An examination of the fate of the prisoners when grouped according to occupations brings some remarkable facts to light. The field-labourers suffered least, next the rope-makers and tailors. The rope-makers slept in the east side, the worst part of the establishment, but during the day they, like the tailors, were changed to a different part. We naturally expect, according to prevailing theories, that those engaged in washing the infected clothes will suffer worst of all; and yet this was not so. The washers were comparatively lucky, and did not suffer nearly so much as the smiths or lockmakers. A comparison of the fate of the weavers and spinners is very interesting. Of each there were thirty-six, but the latter had six cases of cholera and two of cholerine more than the former, with one death less. There was the same number of cases of diarrhœa among each. Both worked in the east and slept in the west side; the thirty-six spinners being distributed in nine wards, the thirty-six weavers in seven. The different manner in which they were affected in No. 97 ward is remarkable. It lies over No. 70, the most fatal ward, and in it slept thirteen spinners and ten weavers. Among the former there was only one case of cholerine and one of diarrhœa, while among the latter there were six fatal cases of cholera and one of cholerine. Of the remaining (twenty-three) spinners in the other wards nine had cholera and died, and five diarrhœa, whereas of the remaining (twenty-six) weavers only one died of cholera out of eight affected, two had cholerine and five diarrhœa. Thus, while the weavers in No. 97 suffered more, in the other wards they suffered less than the spinners. No explanation of this seems even plausible. The only ones who both worked and slept on the east side were the cabinet-makers (nineteen), and they suffered out of all proportion to any of the others, losing nine (equal to 47 per cent.) from cholera, besides three cases of diarrhœa. The twelve potato-peelers, of whom eight were over fifty years of age, worked in one of the cellars into which excrement soaked from one of the privies. They suffered severely, and, it will naturally be said, in consequence of this exposure to infection. And yet such an explanation would be quite unwarranted, for they did not suffer more than forty-one other prisoners of the same age, and the cases occurred at such intervals, that the idea of infection from a common source is utterly untenable.

Influence of Age.

Extensive experience has already proved that both mortality and morbility from cholera vary with the ages of those exposed to infection. Childhood up to the eighth, and youth up to the twenty-second year, have been shown to be the most favourable periods, mortality and mobility both increasing up to, and rapidly after, the fortieth year. But fresh light has been thrown on this subject also by the epidemic at Laufen.

In Laufen, as elsewhere, there were most cases and most deaths from cholera among those over forty, while with diarrhœa it was just the inverse, the younger prisoners suffering most. The rule was also inverted when certain localities came in question. For instance, the great protection enjoyed by those transferred from solitary confinement might be ascribed to their more favourable age, as they were mostly young. But we find that they were very differently affected in different wards. In the dangerous no. 70 there were eight, and in no. 94 an equal number. But though the latter may have enjoyed immunity (except for one diarrhœa) owing to their youth, the former had one case of cholera, four of diarrhœa, and one death.

The medical attendants and nurses enjoyed complete immunity in spite of extraordinary exertions.

* In the case of H.M.S. *Britannia*, cholera had disabled so many that hands were short. In the difficulty, a passing ship was compelled to send some fresh hands on board, and take away some of the afflicted crew of the *Britannia*. However, not one on board the healthy ship took cholera, nor did one of the healthy sailors transferred to the *Britannia* take it.

Among twenty prisoners who volunteered to act as nurses there only occurred two cases of diarrhœa, and one of cholerine, the last ending fatally.

Some of the officials resided in the town, and only spent part of their day in the prison; not one of these suffered. Of the others who were much longer occupied in the prison, but still slept out, several were attacked. Yet very remarkably the epidemic did not spread in the town, in spite of the uninterrupted communication maintained with the prison, and the fact that several officials went through the disease at their residences in the town. The military guard which was stationed in the prison escaped entirely, and did not convey the infection to their comrades in barracks. One woman and her two young children died in the town, and no further cases occurred. She had attended one of the prison-officials who died in the town. But one may well ask, If the mother took it from him, and the children from her, how is it that no one else took it?

There is no evidence whatever that the privies exerted any injurious influence. Some sets of prisoners escaped scot free, while others suffered severely in proximity to the same privy; or all escaped on one storey next a privy, which on another storey might be assumed to be the cause of the cases which occurred.

Disinfection.

During the whole time of the prevalence of cholera in Munich, the greatest care was exercised at Laufen in the way of disinfection of discharges, etc., and each new arrival was washed with carbolised soap. Sulphate of iron and carbolic acid were freely used (120 grammes of the former with ten of the latter per man daily), and yet there is no record of so terrible an outbreak of cholera. At first the cesspools were not allowed to be emptied during the epidemic, for fear of spreading the disease by the infected excrements; but they soon became full to overflowing, and as necessity knows no law, they had to be emptied. The prohibition had to be cancelled, and fortunately a courageous farmer was found who purchased the much dreaded manure. During two entire nights nineteen persons were engaged in removing 69½ tons of this deadly stuff, not one of whom suffered in the least, and their neighbours were equally fortunate.

During the progress of the epidemic the sentences of a number of prisoners expired. What was to be done with them? Were they to be allowed to spread the disease broadcast over the land? The history of each of the eighty-two who were discharged shortly before and during the epidemic was ascertained by police inspectors, and minutely detailed. Of the former (53) two took diarrhœa, and of the latter (29) two took cholera. But though these last deposited their infected stools in several localities which they visited before being brought to bed, they did not give origin to a single case of cholera.

Space compels many facts of great interest to be passed over; but I think sufficient has been said to justify my opening sentence. A perusal of this report cannot fail to disprove the alleged contagiousness of cholera, prove the essential influence of locality on its development, and modify the belief in the localisation of the poison in the stools, and many other opinions accepted in this country relative to this dread disease.

REPORT OF AN EPIDEMIC OF TYPHOID FEVER AT JARROW, DUE TO THE DISTRIBUTION OF INFECTED MILK.

By JOHN SPEAR, Medical Officer of Health.

IT is my duty this month to record a severe and most sudden outbreak of typhoid fever. The district had been tolerably free from the disease for some weeks, when suddenly, on August 13, I found that it had invaded houses in all parts of the town. Between August 3 and August 19 no less than thirty-four cases occurred in twenty different families living within the urban district. Of these cases rather more than half the number were amongst children; and, although they were well marked, the majority were happily not of a severe type, two deaths only being recorded. I am speaking now exclusively of cases within our district; beyond the boundaries several cases have also occurred, I believe from the same cause. The houses in which the disease appeared were, with two exceptions, clean and wholesome; all are supplied with water from the mains of the Sunderland and South Shields Company; in no instance is there a direct communication between the house and the sewer, the gulley opening into the latter being in each case placed in the back yard; in fact, to nothing in the houses or in their surroundings could this outbreak of fever be attributed. The origin of the disease, however, was soon revealed. As house after house was visited, it was found the reply to the question as to where the milk-supply was obtained was almost invariably the same; it came from a certain farm at Monkton, a village about a mile and a half out of the district. Indeed, to this answer there was no exception, in the first fourteen cases investigated and so strong did I think the case even at this time, against the milk, that when I met the dealer's cart coming into the district with the evening's supply, I considered that I was justified in prohibiting its distribution until further inquiries had been made; and this was accordingly done. When I visited the farm the same evening my suspicions were verified; six of the farmer's family, himself included, were laid up with typhoid fever. The water used in the dairy I found was derived from a well situated about eighteen yards from a privy and cesspit, the latter simply a hole dug in the ground, and not in any way paved or otherwise protected. This had been in existence for years, and into it the discharges of the fever patients had lately been deposited. The well, also, was simply bricked loosely round; and there can be no question that soakage had been going on into it from the privy and cesspit. From an examination of the water on the spot it was quite clear that it was contaminated with sewage—a quantity which I found in the dairy, and which I was told had been taken from the well only two days before, was quite putrid. I considered, however, that it was advisable, considering the steps that had already been taken against the dealer, to have a second opinion on the point, and I accordingly forwarded a sample of the water to your analyst. The following is a copy of his certificate.

'The water submitted by Mr. Holt, inspector of nuisances for Jarrow, on the 14th inst., had a faint yellow colour, and possessed a slightly disagreeable smell. It is quite unfit for domestic purposes, being

contaminated with sewage. The following is the analysis :—

Total solids . . .	103·6 grs. per gallon.
Chloride of sodium . .	12·6 ,, ,,
Free and saline ammonia .	0·031 ,, ,,
Organic ammonia . .	0·053 ,, ,,

August 17, 1875.

A sample of the milk taken from the cart stopped coming into the town was also forwarded to the analyst, but although it was found to be poor the presence of water added was not conclusively shown. In connection with this, however, it must be mentioned that the farmer knew that some of his customers were suffering from typhoid fever. This was admitted, and that in one instance, at least, the milk had been returned. Under these circumstances it is only natural to suppose that extra caution would be used. Again, one customer told me that the taste of the milk was so unpleasant that she was obliged to discontinue its use; another, that it turned sour so quickly that it was obliged to be thrown away, and the dealer requested to send no more. Both these statements correspond closely with what I myself saw of the water that had been kept only a short time in the dairy. Of all the samples of milk lately submitted for analysis from this district, I believe without exception, all have been found adulterated; and the milk from the farm in question has not the reputation of being of better quality than these. It is not, however, necessary to prove the fraudulent adulteration of the milk, for it has been shown in other cases that the washing of the cans with polluted water is sufficient to contaminate it. Of this no reasonable doubt can be entertained when the system of distribution adopted in this town is remembered. The milk is not sent from the farms as in most towns, in capacious cans, and afterwards distributed, but every customer has his small tin bottle, holding perhaps a pint of milk or even less, and this bottle is supplied with a cork, which generally has a piece of rag tied round it in order to make it fit closely. It will be obvious that the danger of the milk becoming contaminated in the way I have mentioned, is, by this mode of distribution, increased a hundredfold.

Besides the polluted water I found the whole arrangements of the farm were of a disgusting kind. There was a direct communication between the dairy and a room in which some of the fever patients were lying; worse still, this dairy was used also as a washhouse, and clothes from the fever patients had actually been washed there. The person who milked the cows also (a daughter of the farmer) was constantly about her sick relatives, if not in actual attendance upon them. I found that fever had appeared in the family about a fortnight before the outbreak occurred in our district, that is about July 23. The boy who went out with the milk was the first who suffered, and this case was quickly followed by all the rest. One of the farmer's family died. About the same time, or shortly afterwards, at least four other cases occurred in different families living in the village, and these could, I believe, be traced either to the polluted well-water, or to the milk. To return to the cases in our own district, they may be classified thus :

A. Undoubted cases of typhoid fever occurring in families constantly supplied with milk from the farm in question—25.

B. Doubtful cases. Probably mild typhoid, occurring in families constantly supplied with this milk—3.

C. Cases of typhoid. The families obtaining their milk irregularly, and from different small shops in the town, probably from those supplied from this particular farm, amongst others; although of this I could not obtain definite information—3.

D. Case of typhoid. The child had not taken any of the suspected milk, but had attended a school, together with a child included in class A. Of this school I shall have to speak on a future occasion; it will suffice here to say that the whole closet arrangements are simply disgraceful—well fitted to aid the spread of such a disease as typhoid fever.

E. Cases which I failed to account for, two.

Besides these, the death of a child from diarrhœa was recorded; the child had regularly taken this milk, and the medical attendant told me that he had great doubts whether the case was not really one of typhoid fever.

Of the three cases mentioned in class B, two, at least, might fairly be regarded as mild typhoid; certainly there were many of the symptoms; and strange to say they were the only persons in one family who drank milk from this farm, the other members, who were in perfect health, used condensed milk. Two other instances of this kind also occurred. One man only in a family had undoubted typhoid, and he alone drank milk; in another case, two of three children suffered, the third, who did not like milk, and who did not drink it, escaped. It is also worthy of notice that in every instance where the disease was not traced absolutely and directly to milk, solitary cases of fever only occurred. Whereas, in a large number of the other cases the diagnosis was placed beyond a doubt by the occurrence of two or more cases in the same family. Thus, of the twenty-eight cases included in the classes A and B, seven were multiple, and seven single attacks; whereas of the remaining six included in the other classes, all were solitary cases.

I think if these facts are well considered that no one will venture to say that this outbreak of disease has fallen on this man's customers so heavily, picking them out even in the family circle, by a mere coincidence. But lest this argument should be raised, I will point out that the proportion of the town supplied from this farm is not by any means large; at least eighteen other farmers and milk-dealers send, on an average, an equal quantity of milk into the district; and yet their names, with one or two exceptions, I never heard mentioned in the course of this inquiry. As a matter of fact, too, only twenty-seven families in the town are supplied directly from the farm in question; four of these certainly again retail the milk in small quantities, and to chance purchasers, but this is done only in a small way. Of the twenty-seven families supplied directly from the farm eleven suffered. With regard to the measures that had been taken to prevent the spread of the disease, every house in which fever has appeared has been visited by me, and instructions have been given to the inmates as to the precautions required to be adopted. The inspector has subsequently seen that these directions have been carried out; superintending in several instances the disinfection of premises himself. I have also had plain directions printed for preventing the spread of fever, and these have been found of great service. One of the first cases that appeared in the town occurred in a large private day school, in the family of the schoolmaster. The latter at once complied with my request that he should close for a time his school. Of course I com-

municated the circumstances of the outbreak at once to the officer of health to the rural sanitary authority; and I explained to the farmer that if he made arrangements by which the milking of the cows and the operations of the dairy could be carried on away from the infected premises, and by persons unconnected with the house, that he could then again send his milk into the town; until then its distribution could not be allowed.

It was thought at first that this farmer ought to be prosecuted, and the town clerk was of opinion that proceedings might be taken against him, either under section 2 of the Nuisances' Removal Act, 1863, as amended by the Public Health Act, 1874 (which imposes, by the way, a penalty of 20*l.*; or, at the discretion of the justice, imprisonment, without the option of a fine, for a term not exceeding three months), or under section 38 of the Sanitary Act, 1866; but now that some time has elapsed, and considering that this is the first case that has arisen in this town, and that the farmer has already been severely punished for his culpable carelessness, perhaps you will consider that some leniency may be shown him.

I may say that all the medical gentlemen in this town, to whom I take this opportunity of expressing my grateful thanks for their kind assistance, always and without exception ungrudgingly given, have expressed themselves satisfied that this outbreak of typhoid fever has been traced to its source. I think it will also be admitted that the danger was met and overcome with promptitude; at 4 P.M. on August 13 the first case came to the knowledge of the sanitary officials; by eight o'clock the same evening, fourteen of the cases had been discovered; the houses in which these occurred had been visited, and full instructions given; the contaminated milk had clearly been demonstrated the source of the disease, and its supply cut off from the town. From this moment the spread of the fever was stayed; since the 19th ult. only three fresh cases have appeared in the town. Of these, two occurred in houses previously invaded, and the other in a house only two doors removed from one of these. The houses, moreover, in which the disease extended, were those before spoken of in this report as being unwholesome, and to which also were attached most filthy privies and ashpits. Thus filth and probably the abominable system of privies were the means of spreading the disease when once it was implanted.

The facts which I have laid before you clearly show the necessity for some radical alteration in the mode in which the milk trade is carried on. They teach also another lesson, hospital accommodation should at once be provided for infectious diseases. An equally sudden outbreak of this or any other kind of fever, or of small-pox, may occur at any moment in the crowded tenemented houses, and here all our efforts, without the means of isolating the patients, would probably prove of little avail. The want of a disinfecting chamber, also, and of a mortuary, has been greatly felt during the last few weeks. I beg you will take this matter at once into your consideration. The best possible plan, in my opinion, would be for the three districts of Jarrow, South Shields, and Hebburn to combine for the purpose of erecting a complete fever hospital. If you would agree to this course, I believe little difficulty would be found in inducing the other authorities to join you.

THE NATIONAL IGNORANCE OF SWIMMING.

BY FRANCIS GEORGE HEATH.

THE accomplishment by Captain Webb of the splendid feat of swimming from Dover to the French coast at Calais—a feat which has had no parallel in the history of the world—should at least serve to bring into prominent relief the fact that vast numbers of Englishmen are totally ignorant of the art in which a gallant English sailor has shown himself so great a proficient. It is—although it ought not to be—a singular circumstance, that the greatest swimmer the world has ever produced, should belong to a class which, in England is, as a rule, notoriously ignorant of swimming. This class is the one to which one would naturally look to produce the best swimmers. Yet it has, I believe, never been disputed that there are fewer swimmers amongst seafaring men than amongst any other class of the community. It is really curious that this should be so; but the fault lies certainly more with the system than with the men. A knowledge of swimming should be an indispensable qualification for a sailor; and if such a rule were rigidly adhered to, there is no doubt that many hundreds of lives of seamen would be saved every year. Not only in the case of sailors, but in that of all persons whose business necessitates their occupation in any way in connection with our water ways, both large and small, there should be a system which would exclude all candidates for employment who could not produce a certificate to the effect that they had acquired the art of swimming.

If an estimate could be made of the number of persons unable to swim in this country, it would I think be found that the number is much larger than is generally supposed. Of persons even who have never in their lives bathed in open water or in swimming baths, and have no wish or inclination to do so, the number is by no means inconsiderable. Such persons, of course, have not and are never likely to have any acquaintance with the swimmer's art. But amongst the very large number of bathers, it is not, I venture to think, too much to assert that the proportion of swimmers to non-swimmers—is comparatively small. This assertion cannot be properly tested by a visit, for instance, to a public bath on the occasion of a swimming fête; for it must be remembered that those who are attracted to such displays are chiefly the *élite* of the swimmers in the particular districts where the fêtes may be held, so that it is probable that all who enter the baths can at least swim a little. A better notion can be formed of the swimming capacities of Englishmen by a visit on an ordinary day to any public bathing-place, whether it be on lake, or river, or pond, or at a watering-place. At such places it will generally be found that a very small proportion of the bathers will venture into deep water or anywhere off their legs; whilst the majority are content either to splash the water in a purposeless manner or to 'linger shivering on the brink.'

I speak with experience on this point, and I can give a recent instance which came under my observation. I was bathing on the Paignton Sands, which are much resorted to by bathers; and after my own bath I had the curiosity to notice amongst those who used machines the number of non-swimmers. For two hours, during which a consi-

derable number of persons bathed, there was not one of the number who could swim. Similar facts may no doubt be witnessed at many other bathing-places.

A bath, more especially if it be in salt water, even without swimming, is unquestionably beneficial if it be taken judiciously. But I very much doubt whether the majority of non-swimming bathers do take their baths judiciously; and it is undoubtedly the fact that many severe colds are taken by persons whilst bathing, through the practice of staying too long in the water, or not bathing at a proper time, *i.e.*, when the body is in a fit condition for a bath; and chills taken under such circumstances doubtless oftentimes lead to dangerous and even fatal results. Of course it may be, and probably often is, the case that swimmers expose themselves to the same risk of cold and its consequences. But swimmers are far less likely to take chill than non-swimmers when in the water; and although there are probably very few constitutions indeed which could stand immersion so long as Captain Webb has done, there is no doubt that swimmers can stay a considerable time in the water without risk, and even, under due regulations, with advantage.

Excepting, then, some very few instances in which bathing does not suit particular constitutions at all, it is a fact which will be readily admitted that the vigorous exercise in the water which can alone be obtained by swimming is not merely enjoyable but healthful in the highest degree. I am inclined to think too, with due respect for those medical authorities—their number is probably small—who consider bathing, and more especially sea-bathing, prejudicial, that the instances on which they founded their opinion are of persons who have either bathed injudiciously, or have not sufficiently persevered in the practice. What *can* be done by a swimmer Captain Webb has shown us in a remarkable manner; and it is, I think, fair to assume that that gallant mariner owes his wonderful constitution in no small degree to the circumstance that he has been for so long a time a persevering and persistent swimmer.

I will venture to assert, without fear of contradiction, that the English nation would at this moment be a far finer, stronger, and healthier race if it were a nation of swimmers. In saying this I do not mean to prejudice in any degree the other manly exercises. Indeed, swimming is all the more beneficial if it be accompanied by other exercises; and the taste for such healthy pursuits grows by indulgence.

Under these circumstances, it is very much to be deplored that there should be such widespread ignorance of so simple yet admirable an art as that of swimming. The benefit to the hundreds of thousands of toiling workers in our towns and cities pent, who are ignorant of the art, could they indulge in the admirable exercise, would be incalculable. Vast numbers of these have doubtless never learnt to swim because their circumstances have deprived them of the smallest opportunity of doing so. Others doubtless, who have the opportunity, do not care to avail themselves of it. But much might be done to improve the public taste in this respect, and to provide facilities for learning to swim when the duty has been neglected solely because of the lack of opportunity.

It being granted, as it will be, that a movement having for its object to promote a taste for swimming, and to increase the small amount of bathing accommodation at present existing in many places, more especially in the neighbourhood of towns and cities, would be most desirable, the question arises, how can such a movement be best set on foot? The question has already been partly answered in the metropolis.

In the month of June last an excellent movement was started, under the auspices of the Lord Mayor, with the object of teaching the children in the London board and other elementary schools how to swim. The movement was inaugurated by a meeting at the Mansion House; and at this meeting it was proposed to raise, by voluntary subscription, a fund in order to provide swimming lessons for poor children unable to pay for themselves, and in order also to promote the providing of increased facilities for bathing in the metropolis. At this meeting a subscription list was started, the Lord Mayor heading it by a subscription of ten guineas. The point chiefly urged by some of those who took part in the meeting was, that 'systematic instruction' in swimming should be given to the children. Only such instruction would, in fact, be of any avail. Lord Henry Lennox, the Chief Commissioner of Works, was asked to co-operate with the promoters of the movement, and he readily promised to give such facilities as in his official capacity he was able to do. He at once promised that the use of the bathing lake in Victoria Park should be specially granted to the school board children for two hours every Saturday evening. In furtherance of the same movement, the Chief Commissioner of Works gave permission to the London Swimming Club to erect a marquee in Victoria Park both morning and evening during bathing hours; and with great public spirit this excellent club has undertaken to give gratuitous instruction to the school-children. It seems that for several years the London Swimming Club has been giving gratuitous instruction in swimming without making any appeal to the public for funds. But the club would now appear to be somewhat in need of funds to help it in its public-spirited exertions; and I trust that a generous response will be made to an appeal which has been lately made by the club, for help to defray the cost of providing gratuitous instruction in swimming to the children of the poor.

It is to be hoped that other swimming clubs throughout the country will follow the excellent example of the London Swimming Club; and if they would do so, I am confident they would receive pecuniary support from the public.

Undoubtedly the best way to spread a knowledge of swimming will be to do so through the agency of schools for the young. Not only in Board schools, but in every school throughout the country, swimming should, where bathing opportunities are afforded, form a regular part of school instruction. A correspondent, whose letter appeared in the *Times* on August 30, writing with reference to the recent lamentable bathing accident at Rhyl, remarks that 'bathing is the dread of many schoolmasters,' on account, doubtless, of the responsibility which is incurred—when boys are unable to swim—in seeing that they do not venture out of their depth; and he expresses the hope that the accident at Rhyl will induce 'both schoolmasters and parents to make more adequate provision for the safety of their boys while bathing.' The same correspondent goes on to say: 'Permit me to call attention to the seamen's belt, invented by Captain Ward, R.N., and sanc-

tioned by the National Lifeboat Institution. I have had this belt in use for ten years, and being accustomed almost daily during the bathing season to take from thirty to forty boys of all ages into deep water, I can testify to its value and efficiency. It is free from the objections commonly urged against swimming belts, since it cannot slip from its place, is very durable, and costs only 5*s*. I find, moreover, that boys (especially the timid) learn to swim more rapidly with the belt than without it. The only precaution required is to see that the belts are properly adjusted before allowing the boys to enter the water. By this simple means bathing may be rendered both safe and enjoyable.'

No doubt the use of a good belt like the one described would prove a valuable help to a boy in learning to swim, and would take away much of the disinclination to learn which boys feel through a sort of instinctive dread of sinking in the water: and it would be well if the use of such an efficient aid could be extended and popularised, as it might be, and should be, both by parents and schoolmasters. Every parent, in fact, ought to regard it as a duty to have *all* his children taught to swim; and if there were once a well-established demand for instruction there would soon be, I am confident, an abundant supply of properly qualified teachers forthcoming.

But whilst it is most important to teach the young, adults should not be forgotten. Were there greater conveniences for bathing throughout the country than exist at present, and were there a better supply of teachers of swimming whose services could be made available for the purpose, I am inclined to think that there are many adults who would gladly avail themselves of the opportunity of acquiring an art which, albeit it is so little known, is so simple, and in every way so valuable.

In the preceding remarks I have been regarding swimming chiefly from a sanitary point of view, and have not touched upon the necessity of learning it as a preventive of the lamentable casualties which happen on the recurrence of each holiday season, and indeed, more or less throughout the year. The fatal termination of most boating and bathing accidents is due almost invariably to the fact that the victims of these accidents are unable to swim. Not only is this the case. Other valuable lives are often sacrificed in the endeavour made by those whose courage is greater than their strength to rescue from drowning persons who have ventured into or on the water.

Our national ignorance of swimming suggests another painful consideration, namely, the great number of lives which are annually sacrificed by shipwreck on our coasts. Thousands of such victims have been unquestionably sacrificed because of their ignorance of swimming. We are constantly hearing of vessels going down 'with all hands' and all the passengers--not a soul being saved. Of course swimmers may sometimes be lost under such circumstances, but it cannot be doubted that the vast majority of the victims are non-swimmers, and thus have to perish miserably and helplessly within sight of land, and within reach of help which would avail them could they manage for only a comparatively short time to keep themselves afloat.

Some stimulus has been required in order to promote such a movement as I have suggested; and I trust that stimulus will have been provided in the splendid exploit of that plucky Englishman, Captain Webb.

THE
SANITARY RECORD.

SATURDAY, SEPTEMBER 18, 1875.

THE REGULATION OF THE SALE OF MILK.

WE publish to-day a very dramatic and highly instructive report by Mr. Spear, the medical officer of health of Jarrow, of a sharp outbreak of typhoid fever, which he investigated, traced, and arrested within the space of a few hours. The report is instructive, because it shows how quickly every new fact in the rapidly developing science of preventive medicine, finds its place in the armoury of the preventive health officer, and because it points to a source of remarkable danger to the health of communities scarcely suspected until within the last few years, but which repeated and conclusive experience has now shown to be very common and very rarely guarded against.

The epidemic in Marylebone is so recent that Mr. Radcliffe's official report has only within the last few months been issued in the blue-book. Half-a-dozen instances of outbreaks of typhoid and other fevers, due to the distribution of infected milk have, however, since been reported from Glasgow, from Moseley, Balsall, and elsewhere. The attention of medical officers of health has been therefore repeatedly drawn to this factor of a tainted milk-supply as being a possible cause of limited local outbreaks, and of cases, the eccentric character of which used to baffle sanitary investigation. At Jarrow the outbreak was characteristically sudden. Suddenly on August 15 it was found that within the limited district of the urban medical officer's authority no less than thirty-four cases of typhoid fever had occurred in twenty different families, more than half the cases being among children. The houses were, with two exceptions, clean, and supplied with good water from the mains of the water company. It soon, however, appeared that in pretty well every case the milk was supplied from the same source. The farm was at once visited. It was found that six of the farmer's family were laid up with typhoid fever. The water used in the dairy was derived from a well in immediate proximity to a cesspit; the water was evidently contaminated with filth by soakage, so much so, indeed, that it became putrid on standing two days. The dairy was used as a wash-house; the linen from the infected persons was washed in it; and the person who milked the cows was in immediate attendance on those who were laid up with the fever. There was here, in fact, every disgusting circumstance combined which could make the milk the vehicle

for carrying the fever. The unusual horror of these arrangements, and the violence of the first outbreak, together with the extreme promptitude with which the medical officer in a few hours traced out the causes of the fever and arrested its progress, make this little history more sharply instructive, and more immediately impressive than some of the more protracted and large epidemics to which we have referred. The whole facts are in a small compass, and the causes and effect are seen side by side, and in contemporaneous action.

The circumstances are so horrible that it does not do to dwell upon them long; but it is impossible not to feel that the same risks are, as many medical officers have now pointed out, inherent in the careless and unregulated manner in which the milk-business is now carried out in the majority of instances. A few large companies, such as the Aylesbury Dairy Company, take the trouble to have the sanitary state of their farms supervised, to see that the water in which the dairy utensils are washed is pure, and that the milk is delivered in sealed cans, and subjected to analysis from time to time, so that its purity is preserved intact; and they provide premises suitably arranged for its pure and cleanly reception and distribution. But, as Dr. Hardwicke has pointed out, this is the exception even in great cities, and even in rural neighbourhoods. The ordinary dairy farmer knows nothing of the meaning of purity as applied to water, or of hygienic regulation of his farm and his dairy. The back parlours in back streets, where so much of the London milk is stored prior to its distribution are not always free from sources of direct infection. Dr. Lyon Playfair pointed out that the conveyance of infection by milk was a subject which had been neglected in Public Health Acts; it has, however, been shown now to be so frequent and disastrous in its effects, that it is time that the sanitary authorities were invested with power to regulate the hygienic arrangements of dairy farms and of the places of business of milk-sellers. They ought to be placed under as strict supervision as are slaughter-houses and bake-houses.

'DEATH-TRAPS' IN THE METROPOLIS.

IF the public, looking at the matter from a sanitary point of view, will not recognise the importance of providing an adequate number of suitable bathing places in the metropolis, it should at least refuse to permit the existence of such 'death-traps' as those which abound in the metropolitan canals. Those who take the trouble to read the returns relating to London published by the Registrar General, cannot have failed to notice the large number of deaths which under the general heading of 'accidents' belong to the particular category of 'drowning.' A large proportion of these deaths are those of boys, and this fact must cease to excite wonder when it is remembered that one 'death-trap' alone, situated close to 'Taylor's bridge,' on the Surrey canal, has during the present summer taken the lives of no less than thirty boys. The statement scarcely seems credible, but it is nevertheless absolutely true. On the occasion of the inquest held last week on the body of the thirtieth victim, the newspaper reports stated that 'considerable excitement' was manifested in the neighbourhood in consequence of the terrible fatality of the particular spot on the Surrey canal at which the drowning accidents had happened. The water at this spot, it appears, is so shallow as to be only a few inches deep for two or three feet from the shore, but it then deepens suddenly, and it is said, perpendicularly, to a depth of five feet, a depth quite sufficient to drown any boy unable to swim. The last victim was a boy of nine, who, in company with several others, repaired to 'Taylor's bridge' to bathe. He was the first to undress and run into the water, and his companions stated that he had only proceeded a little way in when he seemed to slip, and then he suddenly sank, and no help being at hand he was speedily drowned. The coroner remarked that it was a great pity something could not be done to protect the poor boys who resorted to the place to bathe. He remarked that public bathing ought to be encouraged under proper surveillance, and dangerous places like the spot in question ought to be fenced off.

The coroner also said that over and over again he had forwarded presentments from his juries on the subject to the canal authorities; but he had found it to be useless to do so, for his suggestions had been always totally disregarded and ignored. The foreman of the jury spoke to the same effect, and the jury, in the conversation which ensued, severely criticised the conduct of the canal authorities in neglecting to take any steps to prevent the large number of deaths from drowning.

Since the inquest was held, Mr. George H. Chubb, the patent-lock manufacturer, has written to the *Times* corroborating the statement of the coroner, that the repeated representations made to the Surrey Canal authorities on the subject of the large number of deaths which had happened at the bathing-place near Taylor's Bridge had produced no effect whatever. Mr. Chubb remarked: 'One would like to hear who the directors, if there are any, of this 'death-trap' can be; it would be interesting to know their feelings on the subject of these thirty deaths. The scandal has become so great that common humanity demands instant action.' A further letter from Mr. Chubb states that on the very day of the publication of his previous letter the Surrey Commercial Dock Company held its ordinary general meeting, when the subject of their 'homicidal canal' was mentioned by a shareholder. But the chairman of the company was reported to have given the following excuses for their indifference respecting the extraordinary number of deaths by

drowning, namely, (1) that no representation from juries had ever reached the directors; (2) that the canal was private property, and therefore the metropolitan police had no power to help the company; and (3) that the Canal Company had police of their own who did all they could to prevent boys from bathing. Mr. Chubb says: 'With respect to this defence I wish to say that the fact of thirty deaths having happened this season is proof enough that the canal police are utterly useless to prevent such accidents; and if it is true that the metropolitan police refuse to act at all because the canal is private property, all I can say is that it is a most shameful truth. As far as my own experience goes, the canal police are never to be seen, while a metropolitan policeman does occasionally saunter along the towing path. Then as to the other statement, either the coroner for East Surrey misdirects his letters, or the chairman has been strangely misinformed.' Mr. Chubb continues, 'I will add that, with the approval of other gentlemen of the neighbourhood, I have written to the Home Secretary, asking for instant inquiry to be made into the whole subject.'

We fully endorse the expressions used by Mr. Chubb with respect to this painful subject; and we are glad that he has taken the trouble to call the especial attention of the Home Secretary to the matter. It is a scandal to the metropolis that such a spot as this bathing-place near Taylor's Bridge on the Surrey Canal should be allowed to exist in its present dangerous condition. But although we hope that there is no other bathing-place that can claim to vie with the one in question in respect to its distressing fatality to human life, we do venture to assert that the canals which intersect the metropolis are full of death traps for bathers; and there are probably few of the public who are not familiar with such newspaper paragraphs as the following, 'Death by Drowning in the Regent's Canal,' or 'Death by Drowning in the Surrey Canal,' even at a period before the present fact of thirty deaths from drowning during one summer in one of these canals had served the purpose of calling especial attention to the subject.

It may be said that the canals, being private property, boys have no right to bathe in them; and that, moreover, the metropolitan canals were not intended for bathing, and are not adapted for it. This is of course true. But as a matter of fact, the practice of bathing in the canals has long been tolerated; and the companies should either strictly prohibit it and take efficient means to enforce their prohibition, or they should, by notice boards or otherwise, give warning of the dangerous parts of the canals. When railways are carried through populous districts the companies are held responsible for the due protection of the public at all places where the public roads cross the lines; and although perhaps the analogy is not quite the same in the case of a canal it is clear that the owners of canals have responsibilities, and if they persistently refuse to take means to prevent in some way such terrible fatalities as those under discussion from occurring on their property they must be held accountable.

We cannot absolve the public from some blame in this matter; for the negligence of public and private bodies finds encouragement in the absence of the healthy public spirit which ought to exist in the metropolis.

Notes of the Week.

THE Barking Local Board of Health, London, have unanimously resolved to light their district by means of mineral oil. It will effect a saving of about 62½ per cent. on the cost of gas.

GREAT confusion having been caused at various times from the existence of two Sedgley Local Boards, Upper and Lower, the name of the latter has been altered to Coseley.

THE Medical Officer of Health for St. George's-in-the-East has decided to communicate with the Metropolitan Board of Works respecting 291 houses which he thinks ought to be dealt with under the Artisans' and Labourers' Dwellings Act.

REVIVAL OF A LOST ART.

THE School Board for London has arranged that 300 selected girls shall be taught cookery by the teachers of the National Training School for Cookery at two centres —one in Marylebone and the other at Greenwich. The Society of Arts offers five free teacherships of cookery to be competed for, and the Education Department gives four shillings a-year to schools on behalf of each girl taught cookery according to the code.

SANITARY INSTRUCTIONS.

THOUGH ignorance of the law in a general way is held to be no excuse for any infringement of it, yet that doctrine, if acted on in a hard and fast way, would at times become rather cruel in its operation, however necessary it might become to vindicate the outraged majesty of the law. To obviate any difficulty from ignorance on the one hand and for the protection of all who have to deal directly or indirectly with infectious patients, several medical officers have drawn up a clear set of rules, and instructions for all cases of contagious disease which may occur in a household and have had them freely distributed in their respective districts. As a model of this class of compiling we may instance the instructions drawn up by Mr. Alfred Ashby, M.B., medical officer of health for the combined district of Grantham, Newark, and Sleaford. The subject is divided into five sections, comprising general and special precautions against the spread of infectious diseases. Directions for disinfecting. Penalties for the neglect of precautions against the spread of infectious diseases. Directions for rendering house-drainage free from danger, and general directions for the preservation of health; the latter subject embracing ventilation, warming, clothing, removal of refuse and nuisances, beverages, food, and management and feeding of infants.

Each subject is treated clearly and concisely, and written in a manner which can be readily comprehended by the most ignorant. Of the same lucid character are the sanitary hints written by Mr. P. Hinckes Bird, medical officer of health for the Fylde Union. Such pamphlets and leaflets cannot fail to spread a wide knowledge of the law and practice of sanitation, and a very casual perusal of either would be sufficient to remove effectually the plea of ignorance in any breach of law which might subsequently be committed.

FOUL WATER-CISTERNS.

MAJOR FRANK BOLTON, the water examiner, in his last monthly report, states that many of the causes of complaint as to the quality of the water delivered for domestic purposes are found on inquiry to be solely attributable to the dirty and imperfectly covered cisterns on the premises of the complainants. He advises that all cisterns should be frequently cleaned out, and every care should be taken by the consumers to prevent the contamination of the domestic water-supply. We much fear that the advice given will fall on deaf ears, as far as the majority of London householders are concerned, who, as a rule, will allow their cisterns to become and remain in a filthy state for want of the commonest care, whilst, oddly enough, these are the very people who cry out against the shortcomings of the water companies. A very little time and trouble would suffice to rinse out a water-cistern, and yet how seldom is this very necessary trouble taken.

As to the quality of the water supplied during August, all the companies effectually filtered the water supplied by them to the metropolis, and it was delivered into their mains perfectly clear and bright, although they were unable to remove the slight colouring matter with which the water from the Thames was stained, owing to the floods which prevailed during the early part of the month.

A CONVENIENT FALLACY.

THE sanitary authorities of towns in which a high birth-rate prevails are loth to surrender the convenient but unsound theory that this fact accounts for a high death-rate. Dr. Tatham, in a recent report upon the sanitary condition of Salford during 1874, after pointing out that the birth-rate in the borough during the year was 44·5, and the death-rate 29·2 per 1,000, states that the high death-rate is partly due to the high birth-rate, as 'a high birth-rate will always be accompanied by a heavy death-rate, owing to the existence of so many children under five years of age.' The false axiom that the birth-rate is the controlling element of the death-rate is now completely out of date, for it has been conclusively proved that in those populations in which a high birth-rate prevails, the large proportion of children and adults living at those ages when the rate of mortality is low, and the small proportion of elderly people, more than counterbalance the high rate of mortality among infants. Compared with the average proportions in the eighteen largest English towns, each thousand of the population of Salford in 1871 contained nine more children under five years of age, and ten less persons aged upwards of sixty years; the standard rate of mortality is, moreover, higher among persons over sixty years, than among children under five. The average birth-rate in Salford in recent years has been considerably over 40 per 1,000, whereas in Bath it has been about 26, and yet the rate of mortality per 1,000 of the populations of these two places, calculated according to the English Life Table, with due regard to the age distribution of each population in 1871, is only 21·5 in Salford, while it is 23·3 in Bath. Sanitary condition being equal, Salford, with its birth-rate of forty-five per 1,000 last year, ought to have had a death-rate nearly two per 1,000 less than that of Bath, where the birth-rate was only twenty-five. It is evident from Dr. Tatham's report that he was not driven to revive this exploded theory of a high birth-rate producing a high death-rate through inability to discover any other cause for the excessive rate of mortality in Salford. It is stated that there are still hundreds of houses in Salford so badly built as to make it next to impossible to put them into sanitary condition; and Dr. Tatham says: 'I therefore hail with satisfaction the movement at present on foot of demolishing these wretched buildings in blocks.' The judicious application of the provisions of the Artisans' Dwellings Act will doubtlessly reduce the high death-rate in Salford, and in future remove the temptation to attribute it, even in part, to the high birth-rate.

THE REGENT'S PARK CANAL.

THE correspondence and discussion which took place last year on the foul state of the Regent's Canal does not appear to have produced any satisfactory result, judging from the letter of a correspondent, who states that the canal is literally nothing but a stagnant pool of filthy water, as the whole of the surface of the canal for some hundreds of yards on each side of the bridge is covered with a thick mass of green weeds, relieved here and there by the decomposed body of some wretched dog or cat, the effluvium from which does not tend to improve matters.

The writer thinks that there must be some means of compelling the Canal Company at once to take steps to remedy this dreadful nuisance. In the event of this warm weather continuing, there can be no doubt that the canal will become positively dangerous to the health of the district.

We commend the foregoing to the attention of the St. Pancras Vestry.

BATHING ACCIDENTS.

IN addition to the usual deaths during bathing which occur every summer, this year two have been due to disease of the heart. Here death has taken place suddenly, either without the patient being drowned at all, or grave syncope has led to drowning. The cause of death in these cases is not far to seek. The heart is already weakened by disease, and in those advanced in years probably undermined by that structural decay termed fatty degeneration. When a person enters water below the temperature of the body two things happen. One is that the cold contracts the blood-vessels of the skin and raises the blood pressure generally, causing an obstruction to the flow forward of the blood at the ventricular systole and so embarrassing the heart. The other is the direct effect of cold which diminishes the energy of the heart. The cold acts directly through the chest walls, but still more by the rush of chilled blood from the skin to the right of the heart; and thus the heart's action is lowered at the time when more energetic contractions are required. In healthy hearts this embarrassment is not at all serious, but in persons who are the subject of organic heart-disease, bathing in cold water is a practice fraught with danger.

COW-KEEPING IN DUBLIN.

COW-KEEPING in Dublin appears to be conducted under especially unsanitary conditions. Dublin is a city with a population of about 250,000, which during the winter months is almost altogether supplied with milk produced by cows living under unsanitary conditions, the cow-keepers' yards being situated in filthy and overcrowded neighbourhoods. The animals are so crowded that they cannot lie down except in turn; the cubic space for each animal averages 268 feet. We have visited numbers of these yards, and with one or two exceptions found them in a most filthy condition. The manure is allowed to accumulate in immense heaps, often overtopping the walls of the yards. We have known these yards for about twelve years, and during that period there has been no visible improvement. In the summer months the cattle are sent out to grass in the vicinity of the city, and during this time of year there is comparatively little nuisance arising from the dairy yards. The sanitary authorities of Dublin, now existing for nine years, has never interfered with these filthy places, except so far as enforcing the removal of manure in the more glaring instances of neglect. The authorities are apparently of opinion, that, contrary to all sanitary experience, animals so kept are not 'a nuisance or dangerous to health' within the meaning of the Act. We have called attention to this matter in consequence of the action recently taken by certain hospital authorities. It seems there is a large and ill-kept dairy-yard situated within ten feet of this hospital. The authorities have complained much of the nuisance, and declare very

rightly that it is injurious to the patients and the resident officers, and that the smell is so abominable that the windows of the building have to be kept constantly closed. The hospital authorities, not obtaining any abatement of the nuisance through the ordinary channels, have appealed to the Local Government Board, who have called upon the sanitary authorities for a report upon the subject. A report has been accordingly drawn up by the executive sanitary officer, otherwise the secretary of the local board. This gentleman appends the initial 'C.E.' to his name, which we presume means that he is a Civil Engineer; but what other knowledge he possesses of sanitary duties may be judged from the fact that he describes as in a 'cleanly state' a yard containing a heap of about thirty loads of manure, situated within thirty-five feet of the hospital windows. The animals are also described as 'fairly clean,' although having only a cubic space of from 195 to 399 feet, the average being about 240. The 'executive officer' compromised the manure question by allowing manure to be accumulated at a distance of eighty-five feet from the hospital windows, and an undertaking that it should be removed every forty-eight hours. This being all the hospital authorities could get out of the sanitary authority, it is not surprising that they appealed to the Local Government Board. The executive officer has got a crotchet into his head that animals cannot be a nuisance or injurious to health so long as the manure produced by them is removed. We recommend the executive officer to consult the medical sanitary officer, and perhaps he will find that gentleman's opinion differs from his own. The executive officer displays his knowledge of law, as well as of medicine, by informing the authorities that 'it is the "accumulation," and not the "animals" against which proceedings should be instituted!' We should like to see either thirty loads of manure or seventy cows in court to disprove a charge of nuisance. We congratulate the Dublin sanitary authority on the extensive knowledge of law, medicine, and engineering possessed by its executive sanitary officer. On the return of the Dublin cows from their country residences, we may possibly make our readers better acquainted with the pleasing conditions under which they enjoy the 'winter in town.'

VACCINATION IN SCOTLAND.

THE Tenth Annual Report upon the Vaccination of Children born in Scotland has just been issued by the Registrar General of Scotland; it relates to the children born during 1873. Due appreciation of the importance and public utility of the report very naturally suggests the inquiry, why similarly complete information is not available for England and Wales? It could undoubtedly be obtained, and its collection and publication by the Local Government Board, or the Registrar General of England, is not only desirable, but it is a matter for regret that it has been so long neglected. It is probably in great measure due to the annual vaccination reports that vaccination in Scotland is so generally and successfully carried out. The knowledge that the details of vaccination are annually published, district by district, naturally stimulates the exertions of the various officials upon whom devolve the responsibility and labour of carrying out the Scottish Vaccination Act. To the medical officers of health, and indeed to all officially or otherwise connected with the administration of public health, it cannot but be important to know the proportion of the population, especially of children, who are protected or unprotected by vaccination. The information now given for England, in the Appendix to the Annual Reports of the Local Government Board, is thoroughly unsatisfactory and incomplete; it is for the year ending September 29, and thus inconvenient to compare with the births; the figures only relate to counties; and, what is still more important, no attempt is made to explain the causes of the large deficiency of vaccinations compared with the births. The Scottish figures, however, leave little to be desired; and we recommend them most earnestly to the consideration of the authorities at the Local Government Board.

The Scottish report before us shows that 119,810 children were born in Scotland during the year 1873, of whom 87·8 per cent. were successfully vaccinated. The statutory period, according to the Vaccination Act, during which vaccination may be postponed is six months from birth, after which vaccination becomes compulsory. Of the children born in 1873 in Scotland, 10,527, or 8·8 per cent., died previously to vaccination; excluding these from calculation, 96·2 per cent. of the remainder were successfully vaccinated, leaving 3·8 per cent. to be otherwise accounted for. This 3·8 per cent. included one per cent. of cases in which the performance of the operation was on medical authority postponed, 0·3 per cent. returned as insusceptible of vaccination, and 2·4 per cent. of cases in which infants had left the districts in which they were born before vaccination, or were otherwise unaccounted for. The number of cases in which vaccination was postponed on medical authority was 1,113 in 1873, showing an increase of 300 upon the number in 1872, and considerably exceeding the number in any recent year. Thus, in 1873 all the children born, except 3,742, or 3·1 per cent., may be considered as protected from small-pox; many even of these 3,742 children were, in all probability, vaccinated after the age of six months, and some may have left the country. During the ten years 1864–73, since vaccination became compulsory in Scotland, only 34,318 children have been born, and survived the age of six months, whose vaccination has not been recorded; this is equal to rather less than 3 per cent. of all the children born. In order that this percentage may be still further reduced, Dr. Robertson, in the report before us, strongly urges the amendment of the Vaccination Act by making vaccination compulsory after four instead of six months. Vaccination should, as a rule, be performed before a child is aged three months; and, therefore, it appears to be a mistake to allow six months to elapse before any measures are taken to look up the defaulters. It is worthy of note that, whereas 75 per cent. of the deaths from small-pox in Scotland during the ten years 1855–64 were aged under five years, this proportion had declined in 1874 to 25 per cent.

VACCINATION AND SMALL-POX IN KEIGHLEY.

MR. M. W. HILLES, the medical officer of health in Keighley, recently stated in a report to the local board that no case of small-pox was reported in the week ending 6th inst., that the epidemic has subsided, and that a recurrence of the disease for some time is scarcely to be expected. He accompanied this report by an analysis of the cases of small-pox that had occurred in the town during the first six months of this year. This analysis is prepared with the view of showing the effect of vaccination, and unless anti-vaccinators are prepared to deny *in toto* the accuracy of the analysis, which with their accustomed hardihood they will probably not hesitate to do, it is incomprehensible how their president, the Rev. Hume-Rothery, of Cheltenham, can reconcile it with his conscience to continue to impose on the credulity and ignorance of his dupes by boldly asserting on every possible occasion that no life was ever saved by vaccination. It appears that 313 persons were attacked with small-pox in Keighley local board district during the first half of this year, of whom 193 were vaccinated and 187 unvaccinated. Among the vaccinated the mortality was equal to 8 per cent. of the cases, and among the unvaccinated the percentage of deaths was so high as forty-seven; in other words the deaths among the unvaccinated were fifty instead of fourteen, as they would have been if the 187 persons had been vaccinated. Here are thirty-six deaths from small-pox in Keighley during the first half of this year clearly due to neglect of vaccination. In this calculation thirteen doubtful cases are not taken into account, of which eight proved fatal and five ended in recovery.

The fact that the mortality from small-pox among the unvaccinated in Keighley during the past epidemic was just six times as great as among the vaccinated, however, only represents the advantages of vaccination from one point of view. Let us now look at the probable degree of protection from attack which was enjoyed by the vaccinated in Keighley. We have stated before that 193 vaccinated persons were at acked, and 187 persons who were unvaccinated; in order to calculate the proportion of cases occurring among the vaccinated and unvaccinated population it would be necessary to know the number of persons in each class. Let us for a moment assume that 10 per cent. of the population of Keighley were unvaccinated at the beginning of the year, and 90 per cent. vaccinated, then the cases of small-pox would be in the proportion of 85 per 1,000 of the 2,200 unvaccinated inhabitants of Keighley local board districts, whereas it would be less than 10 per 1,000 among the 19,800 vaccinated persons. Thus the unvaccinated appear to be nearly nine times as liable to be attacked as are the vaccinated. Even if we assumed that the population of Keighley contained 20 per cent. of unvaccinated persons, which appears very improbable, the liability to attack during the late epidemic would still have been four times as great among the vaccinated as among the unvaccinated. In thus estimating the proportion of the unvaccinated in Keighley, we are not losing sight of the fact recently reported that 50 per cent. of the children born in Keighley Union since the beginning of 1873 remain unvaccinated. There is no reason to believe that previous to 1873 there was any unusual neglect of vaccination in Keighley.

One other point is well worthy of notice in this analysis of the recent small-pox epidemic in Keighley. During January occurred the first six cases; all these were unvaccinated, and five of the six proved fatal. It is more than probable that the infection would not have spread into an epidemic if it had not happened to light upon a number of unvaccinated persons, which caused the first sparks to kindle a conflagration. Except during severe epidemics vaccinated cases of small-pox are comparatively mild, and can be more easily isolated, as they are far less infectious than unvaccinated cases.

In conclusion we may assume that if the population of Keighley had been thoroughly vaccinated, there would in all probability have been no epidemic of small-pox in the district. Secondly that the unvaccinated in Keighley suffered from attacks of small-pox in the proportion of at least six to one of those who had been protected by vaccination. Thirdly, that among the cases of small-pox, after eliminating all those in which vaccination was doubtful, the proportion of deaths was six times as great among the unvaccinated as among the vaccinated. It will be curious to note how the anti-vaccinators will explain away the force of these useful figures which have been so opportunely published by Mr. M. W. Hilles, the medical officer of health of Keighley.

One important lesson may certainly be learned from this severe epidemic, and this is that some means should be adopted by which medical officers of health should have accurate information as to the number of persons in their populations who are unvaccinated. This would enable them to estimate the probable amount of danger to be feared from small-pox, and to use their influence to secure the reduction of this inflammable material, which becomes a source of so much danger to the community when small-pox is prevalent. Next to universal vaccination, it is most important that complete knowledge as to the extent of neglect of vaccination should be in the hands of those on whom rests the responsibility of the sanitary condition of the people.

AT Athenry Petty Sessions, on Tuesday the 31st ult., a shopkeeper in that town, named Dillon, was fined 3*l.* and costs, with the alternative of two months imprisonment at hard labour, for having, to the danger of the public health, appeared in public at Galway while in the convalescent tage of small-pox.

The Health of Watering Places.

XIV.—SOUTHPORT.

THE rate of increase of houses and population in Southport is almost unprecedented, even among watering places. In the last Census Report it is remarked: 'The fishing village of sixty or seventy years ago has now become a fashionable watering place, and a favourite place of residence for business men and retired gentry. This rapid rise is attributed to the salubrity of its climate and the facilities of access from Liverpool, Manchester, Bolton, Wigan, and Preston.' In 1801, the population of North Meols township, which corresponds with the registration sub-district of that name, and together with Birkdale township makes up the ancient or mother parish of North Meols, was returned as 2,096, and at the next two census enumerations had only increased to 2,496 and 2,763 respectively. After 1821 a much more rapid increase of population set in, and at the three censuses in 1831, 1841, and 1851 the numbers returned were 5,132, 7,774, and 8,694. Between 1851 and 1861 the population of this township increased from 8,694 to 14,661, and between 1861 and 1871 it further rose to 22,274. The increase per cent. of population in the three last decades has been 12, 69, and 52 per cent. respectively.

In the census report for 1871 the area of the municipal borough of Southport is not stated; the borough, however, previous to the recent extension, included but a portion (probably rather less than 2,000) of the 8,467 acres contained in the North Meols township and sub-district. The municipal borough of Southport was not incorporated until 1867, but by adopting the limits of the town, as defined by a local Act, it appears that in 1851 the population of the town was but 4,765 persons; it had increased to 8,940 in 1861, and was returned as 18,086 in 1871. Thus the percentage of increase was 88 during the decade 1851-61, and 102 in the following ten years 1861-71. If the rate of increase of population within the old limits of the borough during the ten years 1861-71 has since been maintained, the population may be estimated at 22,740 at the middle of 1874, and 24,400 at the middle of the present year. In towns where the rate of increase of population is so exceptionally high as in Southport, there is always some danger in assuming that this high rate of increase will be maintained. It will be well, therefore, to examine the birth-rate in recent years as a means of testing the approximate accuracy of this estimate of the recent population of Southport before we use it for the calculation of a death-rate.

With regard to the vital statistics of Southport in recent years we must content ourselves with those for the entire sub-district of North Meols, as we have been unable to obtain any figures for the borough except for the years 1873 and 1874. No local report for the year 1874 appears yet to have been published. The compilation of vital statistics, more especially for watering places, is beset with difficulties; these very difficulties, however, only render it the more desirable that every medical officer of health should furnish his contribution to this important subject, which has so important a bearing upon the causation and prevention of diseases. But to return to a consideration of the birth-rate of Southport, with a view to test the accuracy of the estimate of the present population of the borough. During the ten years 1861-70 the average annual birth-rate in North Meols sub-district averaged 33·0 per 1,000; in the four years 1871-4 the birth-rate was successively 31·5, 31·2, 31·5, and 32·7. Thus the birth-rate has averaged 31·7 per 1,000 during the past four years, which was 1·3 below the average rate in the previous ten years. Even if this decline in the birth-rate be accepted as evidence that the present population of Southport is somewhat over-estimated, it certainly appears to furnish an answer to any attempt to prove that the present population is under-

estimated. It is far more likely that the remarkable rate of increase of population which prevailed in the borough of Southport during the ten years 1861–71 will not be maintained than that it will be exceeded in the current decade. It may here be remarked that the birth-rate during 1874 in the borough of Southport did not exceed 27·6 per 1,000 (taking the population to be 22,740), whereas in the ex-municipal portion of the sub-district, including places locally known as Churchtown, Crossens, Banks, and Farbanks, the birth-rate was so high as 54·4 per 1,000; the population of these portions of the sub-district being taken as 3,784. It appears probable, however, that since 1871 a marked increase of population has taken place in some of those ex-municipal portions of the sub-district, although their population declined between 1861 and 1871. The recent enlargement of the boundaries of the borough has added thereto Churchtown and Crossens, into which the town of Southport is now fast extending.

The average annual rate of mortality from all causes in North Meols sub-district during the ten years 1861–70 was 22·3 per 1,000, after correction for deaths in institutions. This correction for deaths in institutions was effected by deducting all those deaths recorded in the Convalescent Hospital, the Hydropathic Hospital, and the Children's Sanatorium, also a portion of those in the Southport Infirmary; and by adding a due proportion of the deaths in the union workhouse at Ormskirk. This correction has the effect of somewhat reducing the mortality both in the sub-district and the borough, as the deaths recorded in the Southport institutions, of inmates admitted from other localities, exceed those of Southport paupers in the workhouse at Ormskirk. In the four years, 1871–74, the annual death-rate in the sub-district, after a similar correction for deaths in institutions, was 22·8, 22·5, 21·6, and 23·7 respectively; the death-rate in these four years averaged 22·7 per 1,000, which slightly exceeded the rate in the preceding ten years.

We have stated above that the rate of mortality in the entire sub-district of North Meols was equal to 22·7 in 1874. It may be useful to notice that in the borough of Southport the rate was only 21·8, whereas in the extra municipal portions of the sub-district above alluded to the rate was so high as 28·5. Thus, the adoption of the figures for the entire sub-district in the Registrar General's Watering Place Table somewhat overstates the death-rate in the borough, as is the case with Llandudno. The death-rate from the seven principal zymotic diseases shows the same result; in the entire sub-district it averaged 4·3 per 1,000 in 1874, whereas it was 3·6 in the borough, and so high as 7·1 in the ex-municipal parts of the sub-district. We shall have to speak presently of the death-rate from zymotic diseases in the borough, here it will be well briefly to notice the locality of the twenty-seven deaths referred to these seven diseases outside the borough; thirteen occurred at Churchtown, including six from scarlet fever, two from measles, and five from diarrhœa; in rural portions of North Meols sub-district six zymotic deaths were returned, including three from scarlet fever, two from measles, and one from gastric fever; in Crossens, two deaths were referred to diarrhœa, and one each to typhoid fever and measles; and in Banks and Farbanks four fatal cases of measles were recorded. As it appears probable that the present population of the ex-municipal portion of the sub-district is under-estimated, thus accounting for the exceptionally high birth-rate we have noticed, it will be well to notice these deaths from zymotic diseases from another point of view. The proportion of deaths referred to these seven diseases, to total deaths, averaged 18 per cent. in the entire sub-district, was 17 in the borough, and 25 per cent. in the ex-municipal portion. It appears, therefore, beyond all question that the sanitary condition of the area lying outside the borough was inferior to that of the borough. The effect of the recent extension of the borough will be to add most of this area to the borough, and thus to place it within the urban sanitary district of Southport, and of its medical officer of health, Dr. H. H. Vernon; until this extension, these places were within the rural sanitary district of Ormskirk. It is undoubtedly an advantage that urban sanitary districts should include all the suburban area around towns, as it is too frequently these suburban parts of towns which require the most constant sanitary supervision, and especially those neighbourhoods in which the increase in population and houses is most rapid. The power of sanitary authorities is, moreover, more stringent and better defined in urban than in rural sanitary districts.

We can now proceed to discuss the details of the deaths registered within the borough of Southport during the year 1874, which after correction for deaths in institutions were 496, and equal, as above-mentioned, to a rate of 21·8 per 1,000 of the estimated population. They included twenty-five which were referred to scarlet fever, twenty-four to different forms of fever, fifteen to diarrhœa, fifteen to measles, three to whooping-cough, and not one either to small-pox or diphtheria; in all eighty-two deaths resulted from these seven principal zymotic diseases, equal to 16·5 per cent. of the deaths from all causes, and a rate of 3·6 per 1,000 persons estimated to be living. In the registration sub-district of North Meols the annual death-rate from these seven diseases in the years 1871–2–3 was successively 4·0, 2·3, and 3·6, whereas it increased to 4·2 in 1874. Among the thirteen English watering places, the statistics of which have been previously discussed in detail in these columns, the percentage of deaths from these seven diseases, to total deaths in 1874, ranged from 5·6 and 8·0 in Eastbourne and Llandudno, to 27·7 and 28·8 in Weymouth and Yarmouth. This mode of estimating the fatality of what have been called preventable diseases is not so correct as the proportion to population, but it has this advantage, it eliminates all chances of error from a false estimate of population. In Southport during 1874 the proportion of the principal zymotic diseases to total deaths was higher than in any other of the fourteen watering places, except Lowestoft, Weymouth, and Yarmouth. The annual death-rate from these seven diseases, in the fourteen watering places during 1874 was so low as 0·9 and 1·4 per 1,000 of the estimated population in Eastbourne and Llandudno, whereas it ranged upwards to 3·6 in Southport, 5·7 in Weymouth, and 6·4 in Yarmouth. This high zymotic rate was due entirely to epidemics of scarlet fever in Weymouth and Yarmouth, while in Southport it was caused about equally by the fatality of scarlet fever, other forms of fever, and measles.

Southport has not been entirely free from the prevalence of scarlet fever since the beginning of 1871. Within the township or registration sub-district of North Meols, six deaths were referred to this disease both in 1871 and 1872: both in 1873 and 1874 the number of fatal cases was thirty-four. The thirty-four in 1874, of which nine, two, twelve, and eleven were respectively returned in its four quarters, included twenty-five in the borough and nine in the extra-municipal portions of the township. Of the scarlet fever deaths within the borough, three each occurred in Linaker Street and William Street, and two each in Virginia Street, Ball Street, and Sussex Road; it may be remarked that these are new streets and are situated in the outskirts of the town. One of the most unfavourable features of the recent mortality statistics of Southport is the excessive fatality from fever, principally enteric or typhoid, which was most marked during the years 1873 and 1874. To this form of disease fifteen deaths in the township of North Meols were returned in 1871, sixteen in 1872, thirty in 1873, and twenty-six in 1874. Of the twenty-six in 1874, those recorded within the borough were twenty-four, two occurring outside; nineteen were referred to typhoid or enteric, one to typhus, and four to simple continued fever. The death-rate from fever in Southport was 1·2 per 1,000 in 1873, and 1·1 in 1874; whereas during the latter year it did not average more than 0·58 per 1,000 in the eighteen largest English towns, and even in Liverpool it did not exceed 0·85. That the fever death-rate in Southport during 1873 and 1874 should have

actually exceeded that in Liverpool affords somewhat startling evidence of an undoubted fact—namely, that the sanitary condition of Southport, in spite of its salubrious climate, high proportion of ozone in its atmosphere, and other natural advantages, is far from satisfactory. Measles only caused one death in North Meols township either in 1872 or 1873, whereas twenty-three fatal cases occurred during 1874, of which fifteen were returned within, and eight without the borough. The twenty-two deaths referred to diarrhœa differed but slightly from the number in 1873, including fifteen that occurred within the borough, of which eleven were of infants under one year of age. These fifteen deaths from diarrhœa within the borough included ten which were registered in the third or summer quarter of the year, equal to an annual rate of 1·7 per 1,000 during the three months. No death was referred to diarrhœa in Eastbourne during the summer quarter of 1874; while in the other watering places dealt with, the annual death-rate from this disease during the same period ranged from 0·9 and 1·2 in Llandudno and Hastings, to 3·5 and 4·9 in Lowestoft and Margate. It was stated above that no death was referred to small-pox or diphtheria in Southport during 1874; it may be added that during the four years 1871–4 only four fatal cases of diphtheria occurred in the North Meols township; and that so far as regards small-pox no death from this disease has occurred since the middle of 1872, although in the preceding eighteen months fifty fatal cases were registered.

Southport, as a watering place, is to the north of England very much as Hastings, Ventnor, Bournemouth, and Torquay are to the south. It would, therefore, be valuable if reliable statistics could be obtained, of the fatality from diseases of the respiratory organs and phthisis among the natural residents of this borough and watering place. In any place, however, which acquires a reputation as a health resort for invalids, the value of the death-register for the compilation of such statistics is at present much reduced on account of the impossibility of satisfactorily distinguishing the deaths of imported invalids. At present no sufficient unanimity prevails even as to the best form for additional information in the register. The birth-place will for this purpose be of little value; what is wanted is the usual residence of all persons who die away from home. Although, for reasons before mentioned, such statistics are far from satisfactory, it will be useful to notice the fatality from diseases of the respiratory organs and phthisis in Southport during 1874. Within the borough sixty-eight deaths in the year were referred to phthisis and sixty-six to diseases of the respiratory organs; these were equal to rates of 3·0 and 2·9 per 1,000 of the population respectively. In the other English watering places the death-rate from phthisis in 1874, was so low as 0·9 and 1·3 per 1,000 in Llandudno and Lowestoft, while it ranged upwards to 2·6 in Worthing and Hastings, and 3·3 in Rhyl; the rate in Southport, therefore, was higher than in any of the watering places except Rhyl. The death-rate from diseases of the respiratory organs in 1874, which was 2·9 in Southport, ranged in the other watering places from 1·8 in Worthing and 3·2 in Llandudno, to 3·6 in Dover. Notwithstanding the difficulties which beset the subject, there is ground for most useful inquiry as to the variations in the death-rate from diseases of the respiratory organs and phthisis in different populations, with a view to estimate the effect of climate upon their fatality. The general sanitary condition and well-being of a population has, however, probably a still stronger influence upon this mortality than even climate.

Infant mortality measured by the proportion of deaths under one year to births registered, was equal to 187 per 1,000 in 1874 in the borough of Southport. In the entire sub-district of North Meols infant mortality measured in this manner, was equal to 174 per 1,000, against 155, 179, and 152 in the three preceding years. In the ex-municipal portions of the sub-district this percentage of infant mortality in 1874 was 136 per 1,000, against 187 in Southport borough. Infant mortality in the whole of England and Wales during 1874 averaged 151 per 1,000, and did not exceed 174 in the eighteen largest towns, which was 13 per 1,000 lower than the rate in Southport. In the thirteen watering places previously referred to this percentage of infant mortality ranged upwards from 95 and 98 in Worthing and Llandudno, to 158 and 180 in Lowestoft and Rhyl. The waste of infant life in Southport is another unfavourable aspect of the mortality statistics of this watering place, which bears unsatisfactory evidence of the sanitary condition of its inhabitants.

The enumerated population of North Meols sub-district in 1871 contained a proportion of 74·7 per 1,000 of persons aged upwards of sixty years. Assuming that the proportion of persons living at these ages in Southport borough is now the same as it was in the sub-district in 1871, it may be estimated that 1698 persons were living at these ages in the borough in the middle of 1874; the deaths of persons aged sixty years and upwards in the borough last year were ninety-seven, equal, therefore, to a rate of 57·1 per 1,000. The average death-rate at these ages in the whole of England and Wales in 1874 was 72·0 per 1,000, and in thirteen other watering places it ranged from 56·4 and 56·6 in Weymouth and Lowestoft, to 70·9 and 79·1 in Llandudno and Rhyl. Notwithstanding the excessive death-rate in Southport during 1874 at all ages, and among infants, the rate of mortality among elderly persons was considerably lower than in any of the other English watering places we have dealt with, except Weymouth and Lowestoft.

Before concluding this examination of the recent mortality statistics of Southport it will be well briefly to refer to the figures relating to the first half of this year. During the six months ending June 30 last, 353 deaths were registered in North Meols sub-district, of which 272 occurred within, and eighty-one outside the borough. The annual death-rate in the six months was so high as 26·8 per 1,000 in the sub-district. In the borough, however, the death-rate did not exceed 22·3 per 1,000, whereas in the ex-municipal portion of the sub-district the annual rate in the six months exceeded 40 per 1,000. During the six months forty-one deaths were referred to the seven principal zymotic diseases in the sub-district, of which sixteen resulted from scarlatina, nine from whooping-cough, six from fever, five from diarrhœa, three from measles, and two from diphtheria. Of these forty-one zymotic deaths in the sub-district, which were equal to an annual rate of 3·0 per 1,000, twenty-one occurred within the borough (showing an annual rate of 1·7 per 1,000), and twenty in the small remaining portion of the sub-district, where nearly 25 per cent. of the deaths were due to these diseases. It appears that since the beginning of the year the mortality from zymotic disease has declined within the borough, but has been exceptionally severe in the ex-municipal portion of the sub-district.

It is worthy of notice that in the death-register of North Meols sub-district the registrar frequently inserts in the fifth column, after the description of the rank or occupation, the words 'of Liverpool,' 'Manchester,' 'Rochdale,' as the case may be. It may be presumed that these words are intended to distinguish the deaths of visitors. In order, however, that this additional and valuable information could be properly utilised, it should be clearly understood what are the rules which the registrar has adopted in adding this particular. In some cases persons are described as merchant or broker, 'retired, of Liverpool;' these probably are really the deaths of residents, as also are others, in which deceased persons are described as widows of tradesmen, etc., of Liverpool, or other places. It may be remarked that fifty-eight of the deaths registered in Southport in 1874 are described as of non-residents, only five being fatal cases of zymotic disease. The percentage of zymotic deaths among the undoubted residents is therefore considerably larger than what has been stated above. Any correction, however, for deaths of non-residents, would require the greatest caution, and the most intimate local knowledge.

Judged by the foregoing examination of its mortality

statistics, the sanitary condition of Southport does not appear in a satisfactory light. We must leave it, however, to the consideration of its sanitary authorities, and of those having the strongest interest in the welfare and sanitary reputation of the place, to decide whether the excessive mortality from what have been recently and expressively described as 'filth diseases,' together with that terrible waste of infant life which has recently prevailed in this watering place, does not make out a strong case for sanitary reform. The fact that the death-rate from fever, the most strongly marked of the 'filth diseases,' has been recently higher in Southport than in Liverpool, with its large proportion of squalor and poverty, alone demands a searching investigation of the sanitary condition of this flourishing 'health resort.'

Dr. H. H. Vernon's exhaustive and able report upon the vital statistics and sanitary condition of Southport in 1873, contains so complete an explanation of the causes of the recent unsatisfactory mortality figures of the borough, that it is scarcely necessary to allude to anything that was not there fully dealt with. The town council, as the sanitary authority of the borough, possesses in that valuable report all the necessary information to enable them to put the town in a satisfactory sanitary condition, and we are informed that much has already been done in that direction, and much more will be carried out shortly. The water supplied by the Southport Water Company is of unusually excellent quality, but the houses in the borough are not yet all supplied with this water, many being still dependent upon impure wells; this is especially the case at Crossens and Banks, where the zymotic death-rate has recently been excessive. That the town has outgrown its old system of sewerage, and that it still, as in 1873, abounds in cesspools, privies, and open middens, must be known to every one who has the most superficial knowledge of Southport. A new drainage scheme has, however, been decided upon, and it is proposed to carry it out shortly at an expenditure of about 40,000*l*; this system will include Churchtown and Crossens, which have been recently added to the borough. An arrangement exists by which cases of infectious disease are received in the fever wards of the local infirmary for the purpose of isolation; it is doubtful, however, whether such an arrangement would in all cases work satisfactorily. Such hospital accommodation should, to ensure its full utility, be under the immediate control of the sanitary authority. The extension of the borough will probably bring it within the provisions of the recent Artisans' Dwellings Act, as the population of the area now included exceeded 20,000 in 1871. The insufficient supply and the inferior class of dwellings for the working classes in Southport have materially contributed to produce the high death-rate; the new Act will provide the means for redressing some of these evils. There is, in fact, every reason to endorse Dr. Vernon's opinion when he said that if the necessary sanitary reforms were carried out, 'instead of a death-rate of nearly 22 per 1,000 per annum, Southport might show a rate of 16 to 17 per 1,000 at the highest.' Such a result will, however, take a lifetime to achieve unless sanitary reform, especially in drainage and sewage disposal, makes more rapid progress than it has done since the sanitary condition of Southport was first forcibly reported to the town council by their medical officer of health. In the interests of the town and of the public we would also urge upon the sanitary authority that they should from time to time *publish* reports on the health of this town, as is done in most other watering places. There is, at present, considerable difficulty in obtaining any authentic information as to the recent health of the borough of Southport. Reticence of local authorities in health matters, more especially in those of towns that cannot show a very clear bill of health, is generally calculated to do much more harm than good.

Southport, eighteen miles by railway from Liverpool, owes little to nature, and everything to art. It has been set down among sand hills, and faces the Irish Channel; it has extensive, gradually shelving sands, which in some places are somewhat muddy. However, there is good sea-bathing here, and the Victoria Baths are of unusual extent, and very complete in their arrangements. The gentlemen's first class tepid swimming bath is 76 feet long by 32 feet broad; the corresponding one of the ladies 65 feet by 28. The whole of the dressing-boxes and corridors are warmed by steam pipes.

The great features of the place are the promenade, nearly a thousand yards long, with a broad roadway, and faced by a sea-wall, and the pier, which runs out a distance of no less than 1,460 yards, and which is provided with tramways and with every convenience for embarking and disembarking. There are also seats and refreshment rooms on the pier. Many attractions have been supplied for visitors, including the pavilion, winter gardens and aquarium, also the Hesketh Park and the Botanical Garden and Museum. There are, too, Zoological Gardens, and an unusual number of bowling greens.

Southport has, since 1806, had a sea-bathing hospital, which can admit upwards of 200. Sick patients are lodged and treated for three weeks for the sum of thirty shillings.

Although it is in the most western part of England, yet the rainfall at Southport is not so great as might have been expected, and owing to the absorptive power of the sandy soil the humidity of the atmosphere is not unusually great. The place is considered particularly healthy for children, and there are, in consequence, a great many schools. There are not many excursions to be made from Southport. Coursing, a favourite sport in this part of England, is an occasional amusement; but Southport's chief recommendation is that it is a convenient sea-side place for the families of Liverpool men of business. Uninteresting although the country round Southport is to the eye, the botanist will find an unusually large number of plants, some 700 species, and the zoologist will find some rare butterflies and lizards.

Rhyl and Southport present many points of analogy, as they are both situated in by no means attractive localities. However, there is interesting country within a moderate distance of the former, none that is near the latter. Nevertheless, owing to its convenient direct access by rail from Liverpool, Southport has completely outstripped its rival in population and importance. It now, including Birkdale, has 21,000 inhabitants, or four times as many as Rhyl.

Report.

PURE WINES AND NATURAL WINES.

IT might appear a paradox to assert that dietetic purity in wine is not an essential sequence of wine being unadulterated by any admixture to increase its bulk or alcoholicity, if that be the true definition of the so-called natural wines. Natural wines may be very pure or, on the other hand, they may contain a most objectionable amount of acetic acid, besides a very variable component of potassic salts, in which sulphuric acid has been combined after the decomposition of the sulphate of lime introduced in the doubtfully natural process of *plâtrage*, by means of *yeso* (gypsum) sprinkled over the *mosto* (grape juice). This plastering is almost peculiar to the white wines of Spain and France, being nearly universal in sherries, and but little adopted in any but the stronger wines of France.

A little work,* dealing with the subject of natural wines, has lately enjoyed a somewhat greater attention than would appear to be due to its intrinsic merits, the rather perhaps because it flings the hatchet with remarkably good will at the sale of wine under the system of co-operation, and also at some of the certificates which may have been unfortunately given by gentlemen who had not previously made the analysis of wines a *specialité*. But if the strictures on these points are carefully examined, it will

* *Sherry from Vineyard to Decanter.*

be found that these very certificates have to a considerable extent been founded upon the very plan of estimating the value of wine suggested by the writer of the book as the only reliable one, in contradistinction to a complete chemical analysis of the more minute but important constituents of wine. The defence of plastering in this *brochure* rests upon the custom of those whose interest it is to keep the wine trade within the mystic bonds of ancient tradition, and the plea that the writer, whose entire ignorance of chemistry is amusing, requires plainer evidence than any yet afforded of any chemical effect produced by this plastering, 'and that it should still continue to be used as it was before the science of chemistry was distinguished from alchemy, as an adhesive!'

Not only may the natural wines possess even injurious properties, but wines which have been fortified with a moderate proportion of really good wine-spirit may be of a dietetic purity far exceeding most of the coarser wines produced from grape juice, genuine enough, but in bad condition from unripeness or decomposition. Tartaric and malic acids in moderation give the true refreshing property to pure wine, but acetic acid, beyond twenty-five grains per bottle, is not only a proof of unsoundness, but a probable precursor of an entire change from wine to vinegar, during which transformation no wine can be considered wholesome. It is folly to hold, with Dr. Dobell, that acid will not generate acid, but that saccharine matters will produce vinegar when there is none, and therefore little heed should be given to the presence of acetic acid in wine so long as it is free from sweetness. Far from this being the case, wines containing more than 20 per cent. of grape sugar and less than 26° of proof spirit, are known to keep for years without producing any ponderable acetous change except in the form of ether; while a mixture of pure alcohol and distilled water, into which less nitrogenous matter was introduced than may be found in some badly made wines, became so attenuated in alcohol by acetous change that the specific gravity rose to nearly the equivalent of water.

Neither can we blink the question of the effects of plastering remaining in wine so treated. If objectionable, they are still there, as may be proved by the simplest chemistry. The sulphuric acid test is quite sufficient to settle the point once and for ever, and as wines may be obtained from the Pure Wine Association guaranteed by the certificates of competent analysts as entirely free from plaster and its effects, it is proved that no necessity exists for this presence; also many of them are equally exempt from adventitious alcohol. Natural wines of the Alto Douro and of the Douro Valley are sold by this association under their true Spanish cognomen as *Consumo*, and are fine, pure, refreshing, and gently stimulating red wines of a character to compare advantageously with the stout red wines of France. Soundness in these is compatible with a sufficiency of tartrates, and the natural astringency is only due to the skins and pips of the grape.

Medical Officer's Report.

COVENTRY.

THE medical officer of health of Coventry, Dr. Fenton, has been able to publish a report relating to the three months ending July 1 last, which affords satisfactory evidence of an improvement in the health of that town. During the year 1874 the annual death-rate in Coventry was equal to 26·0 per 1,000, and the rate from the principal zymotic diseases was 6·4. In the first three months of this year, although the death-rate from all causes was high, the zymotic rate declined to 3·1, and during the three months ending June the rate from all causes declined to 22·0, and the zymotic rate to 2·1. The death-rate, judging from the Registrar General's returns, seems to have fluctuated very much during the past four quarters, though the last return shows a greatly reduced rate. The town is well situated and the sewage difficulty has been disposed of in a most satisfactory manner by the General Sewage Company, so that one great source of disease has been removed. That the declining death-rate is, however, susceptible of further reduction Dr. Fenton, in his report, expresses his firm conviction. He says, 'There are still some sanitary defects, causing much preventable disease, which require to be dealt with, the most urgent being the consumption of impure and polluted water.' It appears that Coventry possesses a water-supply of excellent quality, but a considerable proportion of the houses still use water from shallow wells and springs, which Dr. Fenton has found on analysis to be so impure as to be highly dangerous for drinking purposes. Great opposition is, however, made by many of the owners of small house-property to having the town water laid on. It is stated that the only fatal case of enteric fever in the city during last quarter was 'clearly traced to the use of bad water drawn from a shallow well.' There may be difficulty in the way of forcing property-owners to have wholesome water laid on to their houses; there should, however, be little difficulty in obtaining an order to close a well the water of which can be proved to be dangerous to health.

Correspondence.

REMUNERATION FOR RETURNS OF SICKNESS.

(*To the Editor of the* SANITARY RECORD.)

SIR,—I have received a letter from the Local Government Board, dated September 13, 1875, acknowledging my report, in which the following statement occurs, which will I think be received with satisfaction, both by district medical officers and medical officers of health, and points out the wish of the Local Government Board to interpret the new Public Health Act in a just and liberal spirit.

'Adverting to your remark on page 28 of the report, that there seems to be no means in the present law of giving a district medical officer remuneration for information respecting sickness in his district which he may furnish to the medical officer of health, I am directed to state that the Board consider that it is competent for the Urban Sanitary, if they think proper to do so, to enter into an arrangement to pay the district medical officer reasonable remuneration for supplying you, as medical officer of health with information which you require for the efficient discharge of your duties.'

The portion of my report which has elicited this decision is as follows:

'*Prevalent Diseases.*—I can only speak on this subject from the small amount of personal observation I have had since May, and from the registrars and Union returns, the medical men in the town refusing to give me any information. This is from no want of courtesy to myself, but they say that, from a matter of principle, they ought not to give any assistance or do any work, beyond their contract as district medical officers without increased pay, and argue that, as the district sub-registrars are allowed payment for information of death to the medical officer of health, so ought they to be remunerated as district medical officers.

'I regret there seems to be no means in the present law of giving these district medical officers any extra remuneration. The 1875 Act, section 286, provides that the Local Government Board may appoint a district medical officer to assist the medical officers of a constituent district, and that he should receive remuneration for so doing, but I fear this will only apply to large conjoint districts.'

Feeling that the refusal of the district medical officers, both in my urban and rural sanitary districts was purely a

matter of principle, in which I myself sympathised, I thought it right to mention the matter in my report, and it gives me much pleasure to find that it has elicited so important a decision.

HORACE SWETE, M.D.
Medical Officer of Health
Droitwich Rural and Urban Sanitary Districts.
5, Newbold Terrace, Leamington, September 14, 1875.

COSTLESS VENTILATION.

(*To the Editor of the* SANITARY RECORD.)

SIR,—Under the term of 'costless ventilation,' 'the admirable and inexpensive plan, which we have ourselves seen tried with wonderfully good results,' as you state in your last in the notice of Dr. S. Goldie's paper on 'Ventilation with Apparatus,' was first publicly suggested by myself in the *Builder* some twelve years since, and models have been deposited in the Patent Museum at South Kensington these ten years. It is briefly described in the 'Sanitary Hints' I have circulated in this district thus: 'Raise the lower sash of the window two or three inches, and fill in the opening underneath the bottom rail with a piece of wood; this leaves a corresponding space between the meeting rails in the middle of the window, through which a current of air enters, and is directed towards the ceiling, whence it should escape by a valvular opening.' There is a heaviness and an ugliness, with no additional advantage, in having the board 'five or six inches deep,' as Dr. Goldie suggests. If architects and builders would only make the lower beading as deep as the lower rail of the window, the means of efficient ventilation would always be at hand, and absolutely costless. In about a century, at our present rate of progress, this may be effected. I have windows, especially in staircase and bedrooms, fixed open in this way nine months out of the twelve. You remark, 'But this homely manner of admitting air into the room is, after all, more fit for the upper rooms than for the ground-floor ones. In rows of houses, shutters are mostly used; and, where there are none, how are the sashes to be fastened, since an ordinary sash-fastener would be now useless?' The police will inform you that 'ordinary sash-fasteners' are worse than useless, as they give a false security, and are as easily as possible slipped back from the outside. A screw or wedge, firmly fixed above the lower meeting rail, would secure constant ventilation, and safety from burglarious entrance.

It is strange that while this costless plan is within the reach of all, applicable to public buildings as well as private houses, it is so little adopted, but rather some futile expensive novelty, when the attempt at ventilation is made at all. Often have I shown and explained its act on to intelligent individuals, who gratefully stated they would certainly follow it, to find months afterwards nothing done; how, then, can we expect the uneducated residuum to carry out the plan of even costless ventilation?

I can but be amused to notice that about every twelve months some one appropriates without acknowledgment the above simple and efficacious mode of ventilation, and that it has lately formed the basis and best portion of the patented methods of 'the Columbus of Ventilation,' as he has been dubbed by the head of the press.

P. HINCKES BIRD, F.R.C.S.,
Lytham. Medical Officer of Health.

UNWHOLESOME FOUNDATIONS.

(*To the Editor of the* SANITARY RECORD.)

SIR,—I see by your notice at p. 111 that the old controversy on the danger of building upon soil that has once contained foul matter is being revived at Liverpool, and that it is quietly assumed, as if it were a truism, that soil which has once been foul will always be dangerous, whereas there is little soil which has ever been cultivated, that has not at some time contained most putrescent matter, though that may have been absorbed or decayed long ago, as it is contended is the case in the instances in question. What is the real truth, though it cannot be decided by argument, could be very easily tested by conclusive experiment; the question being, Does or does not an unusual amount of impurity arise from the soil in dispute? No soil is absolutely free from it, and any foundation for a house may be unwholesome if space for ventilation between the soil and the lowest floor be not left, or if the rising of damp up the walls be not prevented; but if the air above the soil be unusually impure, these precautions may not be enough for safety. All that is needed to put that to the test is to place the suspected soil in a basin of water, covered with a bell-glass to keep the suspected air in contact with the water, and protect it from any other impurity than it can absorb from the suspected air. If that air really is unusually impure, the water will become so, as may be proved by tests of great delicacy, and no one has a right to assert that it is so who will not take the very little trouble needed to prove the correctness of his assertion. If he doubt the tests used being delicate enough to show the existence of impurity that is nevertheless sufficient to be injurious, the effect upon the health of a bird, which is very sensitive to impure air, may be tried, though I think such trial quite needless, and less satisfactory than testing for ammonia in water that has been exposed as described. If the air be anything like so bad as it is asserted, it may be proved to be so very easily and decisively. Many persons, however, find it much easier to assert than to prove their statements.

P. H. HOLLAND.

Sanitary Invention.

MILK REFRIGERATORS.

IT is an established fact, though the fact is not so well known as it should be, that the preservation of milk depends very much on the rapidity with which it is cooled. It has been proved that a rapid refrigerating not only destroys any infusoria which may exist in the milk, but also neutralises the animal odour which in very new milk is so objectionable as to render it nauseating to a delicatel stomach. The normal temperature of milk when taken from the cow is 100° Fahrenheit, but if it should be kept for any length of time at a higher temperature than 88° it rapidly decomposes. An invention, therefore, that will prevent this decomposition, destroy the germs of disease, and ensure the safe preservation of milk during its urban and suburban transit in hot weather deserves special mention.

These requirements have been fulfilled in every respect by means of Messrs. Lawrence and Co.'s Patent Capillary Refrigerator. These machines combine simplicity of construction with cheapness, and they are very effective in action, and can be readily cleaned after usage. They are constructed of corrugated tinned copper, over which the milk flows. The water flowing through the interior surfaces, and in an opposite direction to that of the milk, secures the maximum cooling surface in a minimum amount of space.

The machines are being used largely by the best and largest dairy farmers and milk purveyors, though not perhaps to the extent which they deserve to be. We may mention, however, that the Aylesbury Dairy Company, one of the most scrupulous establishments of its kind in London for sanitation, and which is also under the most rigid sanitary and medical control, insist on the use of these refrigerators as a *sine quâ non* by all the dairy farmers who supply them. We believe that other large milk purveyors also are becoming fully alive to the value of this useful appliance. It is only recently that sanitarians have been aware of the fruitful source of epidemics which milk is capable of becoming as a medium for the conveyance of contagion. Any invention, therefore, which has for its objects the effectual destruction of the germs of disease at its source, deserves special praise, and we can recommend these milk refrigerators as being the means of accomplishing in a great measure that desirable end.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

CROSS, Mr. Benjamin Crocker, has been appointed Surveyor to the Corporation, and to the Urban Sanitary Authority, Dewsbury, vice Biddle, appointed Surveyor to the Bootle-cum-Linacre Urban Sanitary Authority.

FRYER, Mr. Charles, has been selected as Town Clerk, Clerk to the Urban Sanitary Authority, and Registrar of the Borough Court, Preston, vice Ascroft, resigned, and will be formally appointed on November 9.

GRAINGER. Mr. John, has been re-appointed Inspector of Nuisances for the Coseley (late Lower Sedgley) Urban Sanitary District: 80*l.* per ann.

MATHER, Mr. George, has been appointed Surveyor and Inspector of Nuisances for the Ely Urban Sanitary District, vice Mr. S. Mather (his father), deceased.

MITCHELL, Mr. Charles, has been appointed Surveyor and Inspector of Nuisances for the Ventnor Urban Sanitary District.

VACANCIES.

BRYNMAWR URBAN SANITARY DISTRICT, BRECKNOCKSHIRE. Clerk.

CASTLETON-BY-ROCHDALE URBAN SANITARY DISTRICT. Medical Officer of Health.

CLAY LANE URBAN SANITARY AUTHORITY. Clerk. Application, October 1, to Mr. Mycroft, Clerk *pro tem.*, Clay Cross.

HEXHAM URBAN SANITARY DISTRICT. Inspector of Nuisances: 100*l.* per annum. Application, 27th instant, to Isaac Baty, Clerk to the Authority.

MIDDLESBOROUGH RURAL SANITARY DISTRICT. Medical Officer of Health. Inspector of Nuisances.

NORTHAMPTON URBAN SANITARY DISTRICT. Inspector of Nuisances: 100*l.* per annum.

WELLS URBAN AND PORT SANITARY DISTRICTS, NORFOLK. Medical Officer of Health. Inspector of Nuisances. Applications, October 2, to E. B. Loques, Clerk to the Authority.

WITHAM URBAN SANITARY DISTRICT. Collector. Application, 24th instant, to J. Howell Blood, Clerk to the Authority.

SANITARY PATENTS.

2712. Improved means of preserving beers, and of recovering sour or turned beers and similar liquids; also milk and solid bodies requiring to be preserved, and apparatus for the purpose. Christopher Benjamin Gibbons and Richard Allison, Ipswich, Suffolk.

2739. Improvements in ventilating buildings, and in apparatus connected therewith. James Livesey, Victoria Chambers, Westminster.

2544. Disinfecting clothing, etc. George Nelson, Leeds.

1195. Manure. Francis George Whitwham, Cannon Street, London.—A communication from François Alcide Bonnefin.

ABSTRACTS OF SPECIFICATIONS.

214. Disinfection of solid and liquid matters. J. Box, Great George Street, Westminster, and E. Aubertin, L. Boblique, and H. Leplay, Paris.

The inventors employ a soluble alkaline phosphate and a soluble salt of magnesia and oxide or other form of iron. They employ these agents by different combinations. They prefer phosphate of potash or ferruginous soda prepared by calcination in a reverberatory furnace, the phosphate of iron with the sulphate of soda and a soluble salt of magnesia such as the chloruse of magnesium. The liquid to be disinfected is allowed to run through the raw products as they leave the reverberatory furnace; the sulphuretted hydrogen is deposited in the state of sulphate of iron. To the liquid thus deprived of the sulphuretted hydrogen soluble salt of magnesia is added; magnesium phosphate of ammonia is formed and precipitates itself with the azoted organic matters. To disinfect solid matters the same products are used dry in powder. They also employ phosphate of lime dissolved in hydrochloric acid, and oxide of iron also dissolved in chlorhydric acid.

272. Ventilating water-closets, etc. J. C. Potts, Handsworth, and D. C. W. Darnell, Edinburgh.

The object of this invention is to ventilate water-closets and other structures in such a manner that sewer gas is excluded therefrom, and the sewer gas delivered into the atmosphere at a point where it cannot gain access to the building, and any exhaustion or diminution of pressure in the closet soil pipe or other pipe communicating with the external drain made to result in a current of fresh air from the atmosphere passing into the building. The soil pipe of the water-closet, sink, or bath opens into a funnel-shaped chamber, the top of which is open and is on or above the level of the ground. The bottom of this chamber terminates in an ordinary water trap. Near the part of the soil pipe fixed into the sewer is a vertical pipe or air shaft rising to the top of the building. Should the equilibrium of the air within and without the building be destroyed from any cause so as to induce a current into the house, the equilibrium is restored not by gas from the sewer, but by a current of atmospheric air passing through a grating at the top of the air chamber into which the soil pipe opens. If, from pressure of wind or otherwise, there is a tendency to a gaseous current from the sewer towards the house, the gas driven from the sewer escapes by the vertical pipe or air shaft, and is delivered into the atmosphere.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer—not necessarily for publication.

[*Mr. John H. Gurnall.*—Your question shall be answered next week.]

SANITARY STATISTICS.

(*To the Editor of the* SANITARY RECORD.)

SIR,—I shall be glad of information on the following point. What is the best book to study for sanitary statistics? How to calculate the population of a large town at the present time?

MEDICAL OFFICER.

[A good handbook upon sanitary statistics is an undoubted want of the day. We know of none that we can altogether recommend, although we would advise our correspondent to read Dr William Farr's article on 'Vital Statistics,' contributed to McCulloch's *Statistical Account of the British Empire*. With regard to the calculation of the rate of increase of population, it is generally assumed that the rate of increase which prevailed between the two most recent census enumerations, has since been maintained. The most convenient form for calculating and applying this rate of increase was fully described in No. 24 of the SANITARY RECORD, published December 12, 1874. There are many cases in which this form of estimate is unreliable, and in which it is desirable that it should be checked by local information as to the present number of inhabited houses.

TOWN LIFE AND MORTALITY.

IN the course of an excellent lecture on Sanitary Science, which Dr. Balthazar Foster has been delivering to the people of Birmingham, he said that town life presents advantages to all who are engaged in either mental or bodily labour, but it also entails certain risks. It is these risks which make up the excessive mortality of towns as compared with that of the country, and raises the death-rate of a town like Birmingham to be half as much again as that of a rural district, and causes Liverpool to lose its people twice as fast as a healthy village. We have in the death-rate increased by one-half, and in some cases doubled, the measure of the risk we run, and we next naturally inquire on what this great mortality depends? The recognition of an evil is generally the first step to its removal, and the clear appreciation of an evil like this is the first step towards the understanding of our sanitary wants. When we accurately know the directions from which the enemy, disease, threatens us, and the modes in which he makes his attacks, we shall be able to analyse the causes of his success, and finally to discover the measures by which he may be repulsed.

PURIFICATION OF SEWER-WATER.

AT one of the recent meetings of the French Horticultural Society, the question as to the purification of the Seine by the employment for cultivation, of sewer-waters, gave rise to some discussion. The following details on the influence of plants on water mixed with putrefying organic matter are taken from the journal of the society. Dr. Jeannel, it is stated, has for a long time had haricots macerated in water, which has thus become tainted, and in which the microscope revealed the existence of a considerable quantity of bacteria. In the month of May he placed in a glass sixty grammes (2 oz. 1 dr. avoird.) of this water, in which he plunged the root of a young plant; another glass contained an equal quantity of the same liquid, but without a root. This latter retained all its putrescent character, while, after four days the other had become purified, and no longer contained bacteria, but in their place large infusoria, which are only found in wholesome water. An experiment made with some water in which some putrefying meat had been placed, yielded the same result. It was sufficient to allow a living root to act for five days for the water to lose all its bad smell and to become purified.

Communications have been received from:

Dr. Gordon, LL.D., Clapham; Dr. D. K. Chambers, London; Mr. J. Whiteside Hime, Sheffield; Mr. Alfred Ashby, M.B., medical officer of health, Grantham; Dr. Joseph Coates, Glasgow; Dr. P. Hinckes Bird, Lytham; Dr. Benj. J. Moore, London; Mr. G. F. Chambers, Eastbourne; Major Frank Bolton, London; Dr. Goldie, Leeds; Mr. John H. Gurnall, Warrington; Mr. N. A. Humphrey, London: Mr. F. G. Heath, London: Mr. J. C. Melliss, C.E., Coventry.

EARTH TO EARTH.—The superiority of the London Necropolis (Woking Cemetery) has been specially recognised in the *Times*, and other leading journals, and it is admitted that here only can the burial of the dead be properly carried out. The Company is prepared to conduct Funerals without the intervention of the ordinary undertaker at any stage of the proceedings. Prospectus free.—Office, 2 Lancaster Place, Strand, W.C.—[ADVT.]

NOTICE.

THE SANITARY RECORD *is published every Saturday morning, and may be ordered direct from the Publishers. Annual Subscription, 17s. 4d.; free by post, 19s. 6d.*

Reading Covers to hold 12 numbers of THE SANITARY RECORD *have been prepared, and may be had direct from the Publishers or through any Bookseller, price 3s. each.*

Original Papers.

THE DEGENERACY OF THE FACTORY POPULATION.

BY DR. F. FERGUSON, CERTIFYING SURGEON.

I WAS appointed certifying surgeon for the Great Bolton District, in July 1861, and, for several years, I passed all children of thirteen years and healthy. Struck by the increasing number of physically feeble children presented to me, I named the matter to the then sub-inspector of the district, Mr. Jones, who told me that I could reject every child not having the ordinary strength and appearance of at least thirteen years of age, although giving proof of being thirteen. I afterwards acted steadily on this view of the law, until the end of 1873. In examining children, I look at the height and breadth, judging of the health, by the general appearance, and of the muscular development, by examining in boys the arm and leg, and in girls the arm only. I weighed and measured only after deciding to pass or reject. In order to secure, as far as practicable, similar conditions, the children were weighed in their ordinary working dress, and without clogs. At first, I made only occasional notes; but, for the years 1869 to 1873 both inclusive, I made an exact record of every case of thirteen passed, and of every case of thirteen or upwards rejected, with the weight of each. For the years 1869 and 1870 the entries were made on loose sheets of note paper, numbered 1, 69, etc., and for 1871 those passed for full time were similarly entered. At the end of each year after summarising their contents, the loose sheets were burned. For 1871 I have, in a pocket book, a record of all cases rejected; and for 1872 and 1873 I have, in a Letts's Diary, a record, for each year, of all cases passed and rejected. When Dr. Bridge and Timothy Holmes, Esq., were pursuing their inquiry, I sent to Mr. Holmes drafts of two letters written in 1870 and 1872, containing the summaries above-named. These drafts have not been returned, and, when applied for, could not be found. Had it not been for this difficulty, it was my intention to have gone carefully over the statistics, and to have presented the results to the public health department of the British Medical Association, recently held in Edinburgh. I now reluctantly present them in an imperfect form.

During the year 1871, I rejected sixty-seven females of thirteen or upwards, average weight 61·33 lbs.; and 101 males, average weight, 61·50 lbs. Of these forty-one, nearly one-fourth, weighed from 53 to 59 lbs. For 1872 seventy-four females of thirteen and upwards were rejected, average weights 63·625 lbs., and 127 males, average weight 64·142 lbs.; 164 females of thirteen were passed, average weight 77·50 lbs. and eighty-two males, average weight 74·091 lbs. For 1873, sixty-four females of thirteen and upwards were rejected, average weight 64·80 lbs., and 110 males, average weight 63·20 lbs.; 173 females of thirteen were passed, average weight 77 lbs., and seventy-four males, average weight 74·90 lbs. Great care has been taken to avoid entering the same name more than once. There is a great difference between the average weight of those rejected in 1871 and of those rejected in 1872-73. I attribute this to the steadiness with which I had rejected physically feeble children; for, as soon as I passed all children who were healthy and thirteen on Mr. Baker's recommendation, I found the number of physically feeble children rapidly to increase. In a letter, dated February 26, 1874, I wrote:—'Within the last fortnight, six children have come to me, producing registers to prove thirteen, and in one case, fourteen years of age. The heaviest of them weighed 56 pounds, and the tallest half an inch over four feet. The average weight of a healthy factory child of thirteen years I find to be 70 lbs., and average height fifty-four inches.

Since the end of 1873 I have kept no continuous record, except for four weeks from July 5 to August 2, 1875, entering such cases only as, in my opinion, were physically feeble. Seventeen children, aged thirteen, came before me, for the first time, to pass full time, weighing from 48½ to 66 lbs. Thirteen for short time, aged from nine to eleven years, weighing from 43 to 52 lbs. One, aged sixteen in October next, weighed not more than the average weight of thirteen years. One, from February 20, 1875, to July 12, 1875, no illness, lost 4 lbs. One, fourteen years old on July 20 last, had on September 6, 1875, lost 2 lbs. One, from April 14, 1873, to July 6, 1875, increased only 4 lbs. One, from January 13, 1874, to August 2, 1875, increased 2½ lbs. One, from May 4, 1874, increased 1 lb. to July 26, 1875. One, from March 24, 1874, to July 20, 1875, increased 1½ lbs.

I am meeting every week with cases like these, in which feeble children, overtaxed by working full time, either lose weight or grow at a very abnormally slow rate. This week six children, aged thirteen or upwards, and weighing from 50 to 59 lbs., have been passed by me for full time.

I am alarmed at the large and increasing number of physically feeble children coming to pass half time. Many giving proof of nine years come before me, weighing not more than 41 or 42 lbs. I am constantly meeting with young persons, aged from fifteen to nineteen years, of not more than the average weight of a healthy factory child of thirteen, whom, when examined for half-time, I noted as physically feeble. For nine years I have closely observed, and am certain that each year the proportion of physically feeble children presented to me has gone on increasing, with the single exception of 1873, when the proportion was 174 to 247 as against 201 to 246 in 1872.

From long and careful trial, I find children in the mills to grow on the average, between thirteen and sixteen years of age, nearly four times as fast on milk, morning and night, as on either tea or coffee. The exact figures are as four to fifteen. Drinking hot liquids is very destructive to the teeth; not more than 5 per cent. of the children I examine, have, at thirteen years of age, sound teeth.

Long and careful observation and reflection have convinced me that a tea or coffee diet is as prejudicial to the healthy development of the brain, and, consequently, of the mind, as it is to the body. Drunkenness has increased much during the last few years, especially among women and young women, many of whom are mere girls. Drunkenness of the parents, improper feeding, and boys smoking, are the main, but not the only, causes of the degeneracy going on in the factory population. These causes are operating as much on our whole industrial population as on our factory workers.

I believe that the universal enforcement of the

'ordinary strength and appearance' clause would compel the parents to attend to the health and proper feeding of their children to secure their passing; and that this would be a great benefit to the children, and in the long run to the parents and to the employers of labour. Age alone, as a test of a child's fitness for work, I regard as entirely fallacious.

VITAL STATISTICS OF IRELAND: CENSUS, 1871.

WE had intended waiting until the completion of the publication of the vital statistics of the Irish Census Commissioners of 1871 before bringing them under the notice of our readers, but as the various volumes are so slow in appearing, we think it right to call attention to those already published. The first volume, entitled the 'Status of Disease,' is dated October, 1873; the second volume, 'Relating to Deaths,' March 1, 1875.

The volumes are of very different value. The first contains a large amount of valuable information, arranged in a convenient form. The second volume appears to us to be unnecessarily large, complicated, and confused; and indeed, considering that systematic registration of deaths in Ireland had been carried on for over seven years out of the ten included in the report, we think the volume in its present shape might with great advantage have been replaced by an account of the results of registration during these seven years.

The subject of the status of disease is treated in the first volume under ten heads, viz., 1. Deaf and Dumb; 2. Blind; 3. Lunatic and Idiotic; 4. Lame and Decrepit; 5. Inmates of Workhouses; 6. Sick in Hospitals; 7. Inmates of Charitable Institutions; 8. Inmates of Prisons; 9. Inmates of Reformatory Schools; 10. The Sick at their own Homes. Although such an arrangement necessarily relates to many questions not directly connected with the 'status of disease,' yet the close relations between disease, pauperism, and crime, fully justifies the inclusion of these subjects in the report. We think an undue proportion has been allotted to the deaf and dumb and blind, the statistics of whose infirmities occupy about a third of the whole volume.

There were on April 2, 1871, in Ireland 4,467 deaf and dumb persons in Ireland, and 1,087 dumb, but not deaf persons. The proportion of deaf and dumb of all kinds to the population is one in every 1,222 of the population, against one in 1,176 in 1861, and one in every 1,380 in 1851. The proportion is greatest in the town of Galway, and in the counties of Limerick, Kilkenny, Cork, Clare, and Tipperary.

Those born deaf and dumb numbered 3,297; those whose mutism is said to be acquired numbered 776. Congenital mutism has diminished, while acquired mutism has increased. Can this increase of acquired mutism be owing to the increase in the prevalence of scarlatina? The number of trades followed by mutes has steadily increased, and the number of those who followed no definite occupation has decreased from 2,376 in 1861 to 1,344 in 1871. This decrease in uselessness, as also increase in education, is mainly to be attributed to the increase of asylums for the deaf and dumb. The number of mutes to be found in a family is of interest, as bearing upon the questions of heredity and consanguinity as causes of mutism; thus we find that in 2,579 families there was only one mute to each, in 359 there were two, in 90 three, in 53 four, in 21 five, in 5 six, and in 2 seven.

'As the degree of relationship is more remote, mutism occurs in a less number of cases. Thus we find that in 201 instances where the parents of mutes were related previous to marriage, 85 were in the degree of first cousins; 63 in that of second; 32 in that of third; 7 in that of fourth; and in 14 they were more remotely related.' We cannot admit that the above statement is conclusive, although certainly suggestive of the predisposition to mutism from consanguinity of marriage. Without knowing the exact proportion of each kind of consanguineous marriage to the total number of marriages, we can draw no reasonable conclusion upon the question. Neither do the several interesting instances of particular cases prove the power of consanguinity in producing mutism. That an hereditary taint is transmissible there can be little doubt, but that without this taint consanguinity has a positive tendency to produce mutism is 'not proven.'

The causes of acquired mutism are enumerated under different heads. It is worthy of note that of 861 such cases, no less than 270, or about one-third, are ascribed to the febrile zymotics, or, in other words, of those sad cases a large proportion may be attributed to preventable causes. Scarlatina caused no less than 126 cases, or about one-sixth of the total; fever caused 81, or one-tenth. Sixty-six were attributed to accidents. The accommodation in institutions for the deaf and dumb in Ireland has largely increased, being 2,364 in 1871, against 1,586 and 1,081 in 1861 and 1851 respectively.

The total number of blind in 1871 was 6,347, against 6,879 and 7,587 in 1861 and 1851 respectively. There are fewer blind males than females, the ratio being 100 to 110·03. There is a slight variation in the proportion to the population, but practically the relation remains the same. The proportion of educated to uneducated blind has increased, so that now the number of educated exceeds the number of uneducated blind, while in 1851 the proportion of the former to the latter was 1 to 6·96. This increase of education, and its resultant increase in occupation, is mainly due to the efforts of the various asylums and institutions for the blind.

It is gratifying to learn that only 526 cases of blindness are attributed to small-pox, against 725 in 1861. Of those who became blind from small-pox 276 were under five years of age; and as all these should have been vaccinated under the Compulsory Vaccination Act of 1864, and as loss of sight seldom follows small-pox modified by vaccination, we may safely state that the majority of those 276 children lost their sight through preventable causes. Ophthalmia, another disease to a great extent preventable, caused 1,642 cases of blindness, and we learn that on the census night there were 603 cases of ophthalmia in Ireland, of which seven were at their own homes, 539 in workhouses, and fifty-seven in hospitals and other public institutions. It does not speak well for the health of Irish workhouses to find therein 89·4 per cent. of all the ophthalmia of the country; there is, however, a marked improvement on previous censuses.

The proportion of lunatics and idiots to the sane population has, according to the report, doubled. 'This increase is,' the commissioners state, 'not so much attributable to an increase of mental maladies

during the past twenty years, as to a greater accuracy in the returns.'

There were 2,955 lunatics, idiots, and epileptics in workhouses, against 1,885 and 1,623 in 1861 and 1851. This increase is partly owing to the removal of lunatics from prisons. But why should lunatics be kept in workhouses when large asylums are maintained for the reception of lunatics?

There were 2,931 lame and decrepit persons in Ireland on the census night.

The workhouse statistics are of considerable interest. There were on the census night 49,000 inmates of Workhouses, of whom one-third, or 16,203, were sick; in 1861, the proportion was the same; but in 1851 the proportion of sick was 1 in 5·9, so that the proportion of able-bodied to infirm has been reduced to about one-half, showing a diminution in real pauperism. It is remarkable how the proportion between sick and healthy paupers varies in different unions; in some unions the number of healthy paupers reached so high as eleven to one sick. This can scarcely be accounted for by the low state of the labour market in these places; and must either depend upon an objection on the part of the sick to enter the workhouse hospitals, or else too great facilities for obtaining workhouse relief. When we subtract the sick and the children, the number of able-bodied paupers is reduced to very small proportions, amounting to only 34·8 per cent., only 10·7 per cent. being so-called able-bodied men. Many of the men can scarcely be described as able-bodied, and many of the women are placed in such circumstances that they are unable to work; so that, on the whole, the number of idlers in Irish workhouses cannot be very large. The occupations most largely represented among Irish paupers are those of agricultural labourers and domestic servants, who number respectively 7,761 and 9,684 of the workhouse inmates. The latter are nearly all females. The number of general hospitals in Ireland has increased from fifteen in 1851 to nineteen in 1861, and twenty-one in 1871. There are thirty-three county infirmaries, thirty-five fever hospitals, eight lying-in hospitals, three ophthalmic hospitals, three lock hospitals; besides these there are military hospitals and workhouse infirmaries.

The institutions for the sick, exclusive of workhouses and military infirmaries, are capable of accommodating 6,543 patients, but only 42·8 per cent. of the beds were occupied. This seems too small a proportion considering the season of the year at which the census was taken. Are these institutions 'ready for the reception of,' or only 'capable of' containing the numbers mentioned? This accommodation is equivalent to one bed for every 813 persons, which seems a very reasonable proportion.

Those suffering from zymotic diseases numbered 24·3 per cent. of the total sick in hospitals.

Particulars are given of the condition of persons in various charitable asylums; but these possess but little interest to sanitarians.

A most remarkable and gratifying sanitary improvement is shown in the reduction of the sick in prisons. In 1851, one in fifteen of those in prisons was sick; in 1861, one in ten; but in 1871 only one in forty-eight. There were 23,923 persons sick at their own homes on the census night, equal to one in every 222 of the population. Of the 23,923 sick at their own homes no less than 23,184 were unable to follow their usual occupation.

In 1851 the total number of sick in Ireland on the census night was 104,495, or one in sixty-three of the population; in 1861, 76,008, or one in seventy-six of the population; and 1871, 71,612, or the same proportion as in 1861. The chief decrease has taken place in the zymotic class, but scarlatina has increased to a great extent, and there was a slight increase in small-pox over that recorded in 1861. There has been an increase in diseases of the nervous system, circulatory and respiratory organs, and a decrease in diseases of the skin and digestive organs. An increase in diseases of the kidneys may be partially owing to the increase of scarlatina.

The volume on the status of disease contains many other interesting matters, which we have not space to notice, and must now consider the volume on the tables of deaths. As already mentioned, this volume is far inferior to that on the status of disease. The record of deaths compiled from the census returns is far from complete; the deaths returned are below the number registered, and we know that the number of registered deaths is below what it should be. We are sorry to find that the census commissioners have adopted a classification of disease differing from that employed by the Registrars General, so that the returns are not comparable with the usual standards. The annual average rate of mortality per thousand in Ireland for the decade ending 1871 was, according to the census commissioners, 13·8, as against 13·7, 17·5, and 14·8, for the three preceeding decades. We believe that the number, 13·8, is very considerably, probably three or four, under the mark. Small-pox has decreased from being a cause of one in twenty of the total deaths in the decade ending 1841 to one in 187 for that ending 1871. 'Small-pox was most fatal in the province of Connaught,' which statement accords with the observations in our report on the recent outbreak at Athenry. The fatality of measles has decreased, but scarlatina has increased sixfold in the last forty years. Whooping-cough has remained about stationary, croup has diminished, dysentery and diarrhœa decreased, cholera was less than in any of the three preceding decades. Zymotic diseases, on the whole, seem to have decreased, but the class zymotic here is not identical with that of the Registrars General. There has been a great increase in the mortality from heart affections, as is also stated from diseases of the respiratory organs.

We think it unnecessary to analyse further these returns, which are of a very imperfect and confused character, and appear to display a backwardness in the knowledge of the uses of vital statistics, which should not be met with in census commissioners.

WATER-SUPPLY: THE ROYAL MINT AND THE TOWER OF LONDON.

BY JOSEPH NEWTON, C.E.

THERE is no doubt whatever that if more care were exercised by the occupants of dwelling-houses, and the authorities of institutions, in respect of the cleansing of water-cisterns, much less would be heard of disease and of death arising from the use of impure water. Such receptacles for Nature's fluid ought, as the SANITARY RECORD last week suggested, to be well rinsed and cleansed at regular and brief intervals. The advantages arising from such a course would be speedily seen and felt, and once fairly

established the operation of cistern purification would soon be regarded as equally important with personal cleanliness. During the summer months, if not throughout the year, every cistern from which water is drawn for domestic purposes ought to be 'looked to' once a week. Paterfamilias, indeed, might be much worse occupied than in devoting a few minutes at such intervals to the superintendence of the work. He would have for his reward the proud consciousness of knowing that he was doing his best to ward off one fruitful source of danger to those most dear to him, and possibly becoming the preserver of their lives.

In time, it may safely be predicted, the public generally will come to recognise the fact that domestic water-cisterns, like their own hands, faces, and persons, require constant washing. It is our mission to shorten the noviciatory period, and to hasten forward the universal acceptation of this important sanitary truth.

In further illustration of these practical views it may be permitted us to cite some circumstances in respect of the past and present water-supplies of the Royal Mint and the Tower of London. The two establishments are, it need hardly be said, national in their character, and the names of neither can be mentioned without exciting a certain amount of interest. There is a literal bond of union between them, however, of which the public at large have no knowledge; but the Mint and the Tower both derive their principal water-supplies from the same source, namely, an Artesian well within the walls of the money-making establishment.

When the Royal Mint was first established (A.D. 1810) on Little Tower Hill—its present site—the Tower moat flourished in all its stagnant and pestiferous glory (?) and from the moat or 'ditch' it was arranged that the coining department of the State should draw its chief water-supply! Hence a tunnel was constructed connecting the Mint with the moat, and on a level with the bed of the latter. The tunnel at its terminus in the Mint opened into a central well some seventy feet in depth, and from this latter four adits were driven so as to connect the main shaft with the four cold-water pumps of as many steam-engines. When, therefore, the latter were working they drew water, or rather an offensive fluid so designated, from the moat, whilst the Thames, when at the flood, made up for the deficiency thus created. It is only just to state that at this period the residences of the officers and workmen were not supplied from the polluted source in question. The New River Company was subsidised in their behalf. The importation of sewage-water for use in the manipulation of the coinage, and the consequent diffusion of its vile odours throughout the work-rooms, however, did not add to the comfort nor yet promote the health of Mint *employés*. The Tower of London was similarly situated, and much of the water used within was drawn up from the ditch without its walls.

Such in brief were the original means adopted for supplying the neighbouring establishments with water, and they continued in existence down to 1844. The march of sanitary improvement in that year extended to the locality of Tower Hill. The writer may fairly lay claim to some share of credit in this respect. It was determined at his suggestion to drain the moat, and soon after this was really accomplished.

Then came the problem to be solved of the future water-supply of the Mint. An Artesian well, to be sunk on the premises, was the accepted solution, and Mr. Clark (then of Finsbury Circus) was entrusted with the work. It was completed after some difficulties and disasters, in 1847. The well has a total depth of 425 feet. For the first 200 feet it is lined with cylinders 9 feet in diameter, and these ought to have rested on the chalk. They do not do so, nevertheless, for the lowest length of cylinder broke into fragments before reaching the chalk bed, and thus prevented the descent of those above. Hence the land-springs are not altogether excluded. The remaining 225 feet consists of a bore hole into the chalk stratum of 12 inches diameter, and which is lined with cast-iron pipes flush-jointed. It had been intended to pierce the chalk to a much greater depth, but the fracture of a boring tool frustrated this design, and the broken implement effectually stopped the way. The water rose, notwithstanding these casualties, to within 80 feet of the surface, and at this depth a set of three pumps of 9 inches diameter and 2 feet stroke, were fixed. A 'three-throw' crank attached to a steam-engine of twenty-horse-power was made to work the pumps, and these delivered themselves into a cistern of iron capable of holding 100,000 gallons, and placed at an elevation of forty feet. This cistern, which is now the great reservoir for supplying the Mint, has its bottom faced smoothly with Roman cement, much resembling enamel, is supplied with a valve for permitting of its being cleansed at all necessary times, and for facilitating this the bottom is slightly out of level.

Two cast-iron mains pass from the base of the reservoir to the ground, and making a circuit of the buildings in opposite directions, they meet in front of the principal building of the Mint.

The overflow from this giant cistern feeds a lower one, holding some 90,000 gallons, and which is a reserve in case of fire.

The supply of water thus obtained is large, and although it is found a little less pure than it might have been had the cylinders rested on the surface of the chalk bed, it is still of excellent quality. By means, therefore, of the Artesian well the Mint is independent almost of out-door supplies, and the residents, who are bound to keep their household cisterns sweet and clean, have no water-rates to pay.

Beyond this the Mint is found neither selfish nor ungrateful. As a kind of return for the service formerly rendered by the Tower, the garrison and other inhabitants of the fortress are now furnished day by day with an abundant supply of spring water from the Mint well. It is on authentic medical record that an immense amount of good has resulted from this arrangement. Diseases which were rife when the moat existed are unknown in the Tower now. In fact, the stream of cold water thus laid on has proved a blessing to the 'Coldstreams,' who are not unfrequently stationed within its walls. From whatever point of view regarded, the mode of supplying the two establishments must be deemed satisfactory, and it is to be wished that all great institutions, as well as all dwelling houses, could be placed on a level in this respect with the Mint and the Tower.

MR. LEWIS ANGELL, C.E., has designed a complete system of drainage for the whole town of Maidstone, which is about to be, or perhaps has been, submitted to the Local Government Board for approval.

THE
SANITARY RECORD.
SATURDAY, SEPTEMBER 25, 1875.

THE SPREAD OF DEGENERACY.

AMIDST our modern progress and advances there exists an ugly fact, namely, the increasing spread of degeneracy. There is no blinking the fact, no opportunity for explaining it away. We may be growing richer, our commerce may be rapidly developing; we may possibly be in earnest about being better educated, undoubtedly the humbler classes are better clothed and better fed; but, nevertheless, the tendency is to degenerate. This degeneracy of the Anglo-Saxon people manifests itself in several distinct forms. On the other shore of the Atlantic it is showing itself as clearly as it is here. Not only is the born American of the Eastern States smaller, sparer, less hirsute, and physically feebler than his robust immigrant ancestor, but the women of the Eastern States are becoming less prolific. Amidst native-born Americans in the Eastern States the birth-rate does not equal the death-rate; while other women are as prolific as they are elsewhere. Writers of unquestionable integrity, and thoroughly acquainted with all the facts, have stated that this is not due solely, or even largely, to any practices—though the existence of such is not denied—but to an ever-increasing sterility. The women to a great extent cannot bear children. This is said to be largely due to the education of the women of New England, a large proportion of whom, at an early period of their lives, are school teachers. It would appear that a highly trained intellectual evolution is antagonistic to reproductive activity. Nor is this advancing sterility confined to the cities of the Eastern States; it is also found further west. A medical writer in Ohio says, 'The statistics of our town (containing between three and four thousand inhabitants) show about forty American families that do not produce any children. A larger number of families, of many years standing, have never produced over two children, many of them only one child. The largest families, as a rule, are foreigners; the most robust children also are most commonly the offspring of our foreign population. When an American family is large they are more liable to be subject to diseases and disqualifying infirmities than are the children of foreigners. In short, the further the race is removed from the original foreign stock, as a rule it is more and more enfeebled. If this be true, then it must happen, when our land is peopled and the foreign influx is ended, that, as a nation, we must retrograde; must take our place in history with those nations which have been, but are not; with the nations that, although existing possibly in name, are nevertheless of no more real political or historical importance.' This is a terrible picture of the prospects of the Anglo-Saxon race in America.

What are the special circumstances which determine the decline of the white races so largely in the American continent, have not yet been fully determined. Along the western border of the white man's area of occupancy, amidst the rude, imperfect culture of the civilising fringe, the white woman appears to retain her old prolificness, to have lost nothing of her fecundity; neither are her offspring either puny or degenerate. The causes then apparently lie in cultured civilisation—somewhere.

In our own land the spreading physical degeneracy manifests other characteristics and possesses other features. In the agricultural districts of England there is neither degeneracy nor barrenness. On the southern downs, on eastern wolds, along the mountain sides of the north and west, our women, and especially those of our peasantry, are in no wise inferior to their grandmothers. On the soil where the Anglo-Saxon has taken root and developed there is no degeneracy, no puniness; except such as is directly and distinctly traceable to scanty food and miserable houses in the worst paid districts. Still in agricultural England there is no decay in the proletariat. In other districts, however, we find degeneracy manifesting itself in various forms. These districts are chiefly the manufacturing and the mining areas. Even the stalwart 'Geordie' of our north-eastern coal fields is giving way to a punier type; while in the spinning districts the advancing degeneracy of the population is palpable to the most casual observer.

In another part of our issue will be found further evidence from Dr. Ferguson, whose statements have previously been alluded to in our columns. Here he gives further details of the actual degeneracy in the Bolton district, where for years, as Certifying Inspector, and in other capacities, he has enjoyed peculiar opportunities for observation. We remarked before that Dr. Ferguson's statements were not regarded as at all sensational by the local press, but rather met with distinct approval therefrom. He now adds some more precise data about the condition of the children submitted to him for inspection. From these it would appear that the degeneracy already existing is progressing with startling rapidity. He says in February last year, 'Within the last fortnight six children have come to me, producing registers to prove thirteen, and, in one case, fourteen years of age. The heaviest of them weighed fifty-six pounds, and the tallest was half an inch over four feet. The averge weight of a healthy factory child of thirteen years I find to be seventy pounds, and the average height fifty-four inches.' In order to fully comprehend the gravity of this statement we must remember that Quetelet has pointed out that at this period of life for males, the children working

in factories are less in weight and stature than children of a corresponding age not so employed; while in the girls there was little difference. But this was forty years ago, and the factory population has degenerated considerably since then. Dr. Ferguson has been an Inspector since 1861, yet he finds that of six children presented to him in one fortnight the best developed falls far short, both in height and weight, of an average factory child of his experience. We must remember that at this age there is a very pronounced modification of the organism looming, which will add to the taxes upon the powers of the system. Quetelet found that this change exercised a marked influence over those working in factories, and after it boys and girls alike dropped, as regards their physical development, behind other children of like age. The labour of the mill and the evolution of the system must form a great strain upon the powers of these imperfectly developed creatures, who, in their turns, are the prospective parents of the next generation. Is there some grim Nemesis behind the steam-engine, we are tempted to ask? and will evolution develop a tiny creature, not only fit, but suited only to guide the steam-engine which has so largely done away with the need for thews and sinews? Will a nation of pigmies with mechanical appliances be better suited to the future condition of mankind than a race of wonted stature? Will the rifle and the rifled cannon enable a dwarfed race to maintain themselves against more stalwart races? Whether or not, the experiment is apparently to be tried ere many generations are past. Possibly England may be purchasing her commercial prosperity at the cost of the physique of her masses.

As to the causes of this physical degeneracy Dr. Ferguson lays great stress upon the absence of milk from the dietary of the factory hand. Not only does his experience fall in with that of others that a tea and coffee diet leads to weedy children; more positive experiments have been made to test the difference. The results are striking and speak eloquently for themselves. There are other matters, however, than the absence of the natural food, milk, from their dietary. The action of tea and coffee falls chiefly upon the nervous system, and such children are more irritable and excitable than other children. There is a condition of nervous activity instituted in them, manifesting itself in periods of excitement with alternations of depression. Lulled with opium when infants; reared on tea and coffee amidst surroundings calculated to give an unhealthy stimulation to certain portions of the nervous system; these unfortunate children grow up puny, dwarfed indeed, with a nervous system in a state of mobility and with an unstable mental equilibrium, which predisposes them to indulgence in neurotics. Consequently, we find indulgence in alcohol on the increase in both sexes; and not only does it tell distinctly upon the parents, but it possesses a modifying influence of no little power over their offspring. Tobacco, too, is extensively indulged in by mere children in the factory districts. There are other agents, however, in action whose influence must not be overlooked, or underrated. In the factory, and even more, perhaps, in the mining districts, marriages are contracted betwixt mere children. The offspring of immature parents are notoriously of a degenerate character, often morally as well as physically. Such childbearing, too, arrests the further development of the mother's physique at least, and this early motherhood tells against the offspring of her later years. In the thoughtless indulgence and impaired self-restraint of the parents do we find one factor at least of the inability to control themselves so commonly shown in the areas now under consideration. The brutal assaults, the reckless indulgence of the passions, regardless of all consequences, even to the destruction of life, so notoriously frequent in certain districts, are but one part and one form of the degeneracy which is spreading amidst our industrial populations. The whole subject reflects most strongly upon our boasted advances, and there is room for fear—much fear indeed—that our advance in some directions is attended with retrograde changes of a very deplorable character in others. The growing degeneracy of certain important sections of our nation is such as to demand the most earnest attention of our statesmen, and to evoke some regulations which may at least tend to check its rapid spread.

A FLOATING HOSPITAL.

OUR American cousins have devised a new form of charity, which is just now very popular in New York; and which, from having received much favourable notice from the newspapers, has obtained large pecuniary support, and been carried out on a considerable scale. It is thus described by a Boston correspondent:

'About eight years ago there was organised, in connection with St. John's Church, belonging to the corporation of Trinity parish, an association called "St. John's Guild," its object being to aid the poor in the lower portion of the city. Three years ago it ceased its connection with St. John's Church, and became an independent organisation. In 1873 an attempt was made to collect a fund to be called "The Destitute Sick Children's Relief Fund." With the money thus collected a large barge and steam-tug were chartered, an abundant supply of proper food was placed on board, and two trips were made on the bay, carrying a full load of children and their mothers. This seemed to be so popular, and funds came in so freely, that last year they were able to provide eighteen excursions on the waters about New York. Upon these trips 15,202 children and their mothers were taken, at an expense of 5,193 dollars. Last fall the hull of a steamboat was purchased, and

fitted up as a barge; and this is the "Floating Hospital of St. John's Guild." I think that it is a misnomer, as it conveys a wrong impression of its use. This barge is 210 feet long, and thirty-six feet wide at its widest part; it has an upper and a lower deck, the latter so arranged that it can be made comfortable in case of a storm, by means of shutters. The upper deck is under cover, and has curtains at the sides, so as to protect the children from the sun. The space below deck, corresponding to the lower cabin of a steamboat, is divided into two rooms; the smaller one, forward, is fitted up as a kitchen; the other is the dining-room, having two rows of tables running its whole length, and capable of seating about six hundred children. On the main-deck forward, separated by a passage-way running fore and aft, are two small rooms, containing seven little beds each, for those children who are too sick to be up. They are well ventilated, but I understand that they are not used much. Back of these wards is an open space, broken only by two wide staircases leading to the upper deck. Pretty well aft are several rooms, one for the superintendent and the ladies who may wish to go on these excursions; back of this is the doctor's room, who goes on the trip, and who is expected to provide medicine for those who may require any. Behind this are the water-closets. The upper deck is entirely free of any obstruction, and the children and their mothers are kept up there, and not allowed on the lower deck. The barge is propelled by a tug-boat. Excursions are made on Tuesdays, Thursdays, and Saturdays of each week. The barge leaves the foot of Twenty-Third Street and East River at eight o'clock, stops at Market Street at nine o'clock, then at West Tenth Street and at West Thirty-Fourth Street and North River, taking on at these places as many as apply. The excursionists are provided with a breakfast and dinner. They usually take from nine hundred to fifteen hundred children and mothers on each trip. To provide for so many mouths they use six hundred pounds of beef, eighty gallons of soup, three hundred and fifty loaves of bread, three hundred and fifty quarts of milk, one barrel of hominy, three fourths of a barrel of sugar, one third of a chest of tea, and one tub of butter.

'The total cost of the barge was 20,000 dollars, and the expense of each excursion is about 200 dollars.

'Every physician in the city has been furnished with cards like the following:—

FLOATING HOSPITAL OF ST. JOHN'S GUILD.
FREE EXCURSIONS
FOR DESTITUTE SICK CHILDREN AND THEIR MOTHERS.
Every Tuesday, Thursday, & Saturday.
Pass_____
Residence_____
Sent by_____M.D.
Under the Supervision of REV. ALVAH WISWALL,
Master of St. John's Guild.

These cards are distributed as opportunity offers. On these excursions they are not able to go more than twenty miles from the city, their object being to give their voyagers fresh air. The children who go on these trips are of course from the lowest dregs of society, and it is with the greatest difficulty that the barge is kept in even a fairly clean condition for a short time. Many of the children are suffering from diarrhœal disease, some from marasmus, while others are perfectly healthy. How much real good is done in this way it is very difficult to say; there is no doubt an immense amount of suffering among tenement-house children, but whether this is the best and only way to reach and relieve it is another question. It no doubt does real good by giving the children great pleasure, and by making them feel that they are not entirely forgotten by those in better circumstances; but that it has much effect on infantile mortality may be doubted very much. The question of how much evil may come from crowding children together, from contagious diseases, etc., should not be lost sight of. The success that has attended the collection of the relief fund is due in a great measure to the New York press, which has from the very beginning given the enterprise its hearty support.'

Notes of the Week.

The Cambridge Senators have fixed their first examination for degree in State Medicine to take place on October 5.

THE town council of Rotherham have engaged Mr. Bailey Denton, C.E., to advise them with reference to the disposal of the sewage of their town.

MR. T. J. DYKE, medical officer of health for Merthyr Tydvil, has been unanimously re-elected for the ensuing year. This makes the tenth occasion on which Mr. Dyke has been re-elected to the office.

THE medical officer of health in St. George's-in-the-East has taken active steps with a view to enforce the provisions of the Artisans' Dwellings Act. He has notified to the Metropolitan Board respecting no less than 291 houses in his district which ought to be dealt with as being unfit for human habitation.

AN 'Association of Medical Officers of Health of Yorkshire' has been formed, and the following Officers appointed, viz., President, Samuel William North, M.R.C.S. Eng. and L.M., L.S.A. Lond. Secretary and Treasurer, John Sebastian Wesley, M.B. Univ. Lond., M.R.C.S. Eng., L.S.A. Lond. Committee-men, William Swift Wade, L.R.C.P. Edin., L.F.P.S. Glasg., and L.M., L.S.A. Lond.; George Goldie, L.R.C.P. Edin., M.R.C.S. Eng.; Titus Deville, M.D., M.R.C.P. Edin., M.R.C.S. Eng; Thomas Britton, M.D. Univ. St. And., M.R.C.S. Eng., L.S.A. Lond.; Edward Buller Hicks, L.R.C.P. Lond., M.R.C.S. Eng.; and Henry Franklin Parsons, M.D. Univ. Lond., M.R.C.S. Eng., L.S.A. Lond. The next meeting is to be held at Wakefield on October 27.

SICKNESS RETURNS.

THE correspondence which Dr. Horace Swete has elicited from the Local Government Board, and which we published last week, will give general satisfaction to health officers throughout the kingdom.

We have predicted from the first, and experience has proved, that one of the great drawbacks to the efficient working of the Sanitary Acts has been the want of means of obtaining returns of sickness. The district medical officers have in some cases furnished this information to the medical officers of health gratuitously, and in other cases have reasonably declined to do so without remuneration.

The authorities at Gwydor House have shown a desire to act in a liberal spirit to their officers, and we trust that the urban and suburban authorities will act in a similar manner, and so avoid any of those unseemly disputes which took place between the registrars of births and deaths and the sanitary authorities.

A GIGANTIC WATER-MAIN.

THE Chelsea and Lambeth Water Works Company are just completing a length of main extending from Thames Ditton to Peckham Rye, a distance of eleven and a-half miles. Much of the work has been done these two years past, but a gap in the connecting link existed at Wandsworth. The water company wished to carry their main across the Wandle, under the bridge which spans that river, and, as it were, dependent from that structure. This the people of Wandsworth objected to lest the bridge itself should be placed in jeopardy. A compromise has been effected now, and abutting piers, resting on distinct foundations, have been constructed for the purpose of carrying the great artery across the river, and by the side of the somewhat venerable viaduct which is more useful than ornamental to the town of Wandsworth. The main is composed of pipes—or cylinders as they might be termed—two feet nine inches in diameter, and the cost of the whole work must amount to many thousands of pounds.

A NEW KIND OF POISONOUS DRESS.

ACCORDING to a report by Professor Gintl, in the *Lotos*, it appears that the public is exposed to a new source of poisoning from the use of arsenical glycerine and the arseniate of alumina as mordants. He states that these substances are now coming largely into use, especially among the English and Alsatian manufacturers of cotton printed goods, as substitutes for albumen which is much more expensive, some substance being required to fix especially the aniline colours, which are now so much in demand. Such goods have recently been sold in Austria and especially in Prague, containing, according to Professor Gintl, as much as fifteen to twenty-five grains of arsenious acid, in the form of arseniate of alumina, to the yard; and this is by no means an insoluble salt, but one more poisonous than the much abused green arsenic colours. The more suspicious fabrics are stated to be those of a violet ground with white figures, and those printed in brownish yellow or reddish brown designs, and which are sold at low prices.

'THE GREAT UNWASHED.'

INCALCULABLE harm has, I fear, been done during the past summer to thousands of people who reside in the eastern half of the metropolis. The concession of evening bathing in Victoria Park—to which I directed especial attention in the SANITARY RECORD of July 3—has not, considering the circumstances under which it has been 'enjoyed,' by those to whom it was made, answered the public expectation; and unless those circumstances are materially altered in the event of any extension of the concession, what was hoped would prove a blessing to tens of thousands of the toiling poor will unquestionably prove to be a curse. Events have indeed fully justified the warning which I gave during the course of my previous remarks on this subject.

It will be remembered that the bathing lake in Victoria Park is the only safe and easily accessible piece of water available for bathing purposes in the whole of the east of London. This is proved by the very large number of persons who flock to it from all parts of the surrounding districts during bathing hours. Formerly, and for many years, the length of the lake was only 150 yards. But as the population surrounding Victoria Park became denser it was found that the size of the water was totally inadequate for the accommodation of those who came to use it. The Commissioners of Works, therefore, after mature consideration, determined to effect an enlargement of the lake, which was, in consequence, doubled in size. This alteration attracted an increased number of bathers; but the hours during which the water could be used for bathing purposes were limited to four each morning—namely, from four until eight o'clock.

It is obvious that to great numbers of the working classes this limitation of the time for bathing amounted to a practical prohibition. That immense numbers of people were thus prevented from indulging in the luxury of a bath in the open air on week-day mornings was shown by the fact that the numbers who came on Sunday mornings was considerably more than double the week-day number.

It was therefore with an excellent object that the Chief Commissioner of Works was solicited to grant permission to the public to bathe for one hour each week-evening during the summer. This permission it will be remembered was given last summer for the first time, and it was distinctly understood that it must be regarded 'as an experiment' only. Lord Henry Lennox himself went down to Victoria Park during the progress of evening bathing to see how the experiment was working, and he expressed himself greatly pleased with what he saw—so much so indeed that on the renewal of the request that bathing should be permitted in the evening during the present summer he readily granted it. No complaint appears to have been made of the way in which the bathers conducted themselves during last season, and the park superintendent reported to the Chief Commissioner that the people frequenting the lakes had shown the utmost readiness to observe the park regulations laid down for their guidance.

So far everything would appear to have been satisfactory; and hence the renewal of the permission by the Chief Commissioner during the present season. But the mistake which was made in reference to this matter was in considering that the success of the experiment would merely depend upon the conduct of the bathers; sufficient attention was not given to the wholly inadequate accommodation afforded by the bathing lake; and although this matter was mentioned to the Chief Commissioner of Works, and a sort of promise was given that it should be attended to nothing in this direction has been done.

The result has been what I ventured to anticipate in my previous paper on this subject. I said the use day after day of a comparatively small piece of water by the vast numbers of people who resorted to Victoria Park to bathe would do more harm than good, unless means were taken to change the body of water from time to time. But nothing has been done to change or purify the water during the whole of the past summer, and what has been the result? The lake has been brought into a foul and filthy condition—into such a condition in fact that for a healthy person to bathe in its waters would have been one of the readiest means of inviting contamination. In the first place we have a still body of water, practically without inlet or egress, for the small pipes bringing in water at one end and taking it out at the other, have proved simply useless as a means of changing the contents of the lake. The mere influence of the summer sun would, under ordinary circumstances, cause such a body of water ere long to become unwholesome. But day after day thousands of men and boys, with bodies of swarthy hue, have repaired to this bathing lake, and by the industrious use

of soap have succeeded in transferring, in too many instances it is to be feared, all kinds of impurities from themselves to the water.

There has, of course, been no restriction. Clean and unclean have used the lake together, and many of the former have doubtless succeeded in contaminating the water to the injury of the latter. It is unquestionably the fact that the water has been fouled to an alarming extent. Yet thousands of poor men and boys, unsuspicious of the fearful risks which they have been running, have continued to bathe in this filthy water; and it seems almost certain that in a very large number of cases they must have carried contagion away from it.

Surely the fact that thousands and tens of thousands of persons come day after day, many of them from long distances, in order to indulge in the questionable 'luxury' of a bath in such filthy water shows the vast need which is felt for ablution, and demonstrates the urgent necessity of providing sufficient accommodation for what, under proper regulations, would prove both healthful and enjoyable, but which, under present conditions, is neither one nor the other; being, on the contrary, fraught with great danger to health.

The Chief Commissioner of Works has taken a great deal of interest in this question, and I trust he will continue to do so, and take means, without loss of time, in order to make the bathing accommodation in the East End Park as good as it might be made without a very large expenditure of public money.

THE NEW FOREST.

So much interest has been taken by the public in the question relating to the preservation of the New Forest that the result of the inquiry which has been instituted into the subject by a Select Committee of the House of Commons will be regarded with more attention than is usually bestowed on questions which are investigated by parliamentary committees and elucidated through the medium of 'blue books.' During recent years the public has had to maintain a prolonged struggle for the retention of its rights over many of its commons and free woodlands. Epping Forest had scarcely been secured from the hands of the spoiler ere it was understood that both the New Forest in Hampshire and Dean Forest in Gloucestershire were in danger. A bill was introduced early in the late session having for its object to enable the purchase to be effected of all the commoners', and what are termed the 'free miners'' rights in Dean Forest, *i.e.*, common rights both over and under the soil. The bill in question provided for the appointment of a commission which was to be empowered to buy up the common rights already referred to, the pretext for this course—which would have finally led to the enclosure and obliteration of the forest at any time when some future minister of the Crown might happen to take the whim into his head—being merely that additional dwellings were needed for the mining population of Dean Forest, and that certain sanitary improvements in the mining villages were required. The evils sought to be remedied could have been removed by a far less clumsy and dangerous process. A formidable opposition was accordingly very properly offered to the proposal to sacrifice Dean Forest on the principle of employing an avalanche to crack a nut, and the Dean Forest Bill was, in consequence of this opposition, withdrawn before it had reached its second reading in the House of Commons.

The public, remembering that a parliamentary committee had virtually recommended the destruction of Dean Forest, might be pardoned if it ventured to look with some suspicion upon the proceedings of the Select Committee on the New Forest. However, the result of the investigations of this committee will probably be hailed with considerable satisfaction. The committee appear to have had some regard to the public feeling that was elicited in consequence of the fears which were entertained concerning 'the proposed destruction of the New Forest,' for they venture to say in their report just issued that were the New Forest by disafforestation to lose 'its especial character of wildness by being transformed into a mass of regular and formal plantations' the loss to the nation would be 'irreparable.'

The question of enclosure has been dealt with by the committee in a fair and liberal manner. The entire forest is about 63,000 acres in extent. It is, therefore, more than ten times the area of Epping Forest. The whole of this large extent of forest was formerly open and unenclosed, although it had served as a nursery for timber required for the navy. But in 1698, for better growing and preserving trees for timber, it was thought desirable to enclose a portion of the forest for that purpose. About 6,000 acres were accordingly enclosed at that time, a special Act of Parliament being passed in order to sanction the proceeding. Subsequent Acts authorised further enclosure of the waste of the New Forest. 'The Deer Removal Act' of 1851, for instance, empowered the enclosure of 10,000 acres in addition to the 6,000 acres previously enclosed. These two enclosures extended over an area, therefore, of 16,000 acres of the waste of the forest. But it appears that the present area of the New Forest actually enclosed is as much as 19,590 acres, the balance of enclosure having been authorised by an Act passed in the reign of George III. The Chief Commissioner of Woods and Forests, who is known to be a functionary who looks very jealously after the rights of the Crown, is, it seems, of opinion that the Crown has really the right to extend its enclosures over the whole of the forest. The opinion of this functionary, however, is considerably modified by the admission that it is the 'spirit' of the Acts of enclosure and not their 'letter' which appears to him to authorise such an extensive enclosure on the part of the Crown. But in a matter of this kind the public would be sure to look well after its rights, and would see that the rights of the Crown were settled according to the 'letter' of the law; for experience has shown, notably in the case of Epping Forest, that the Crown rights have nothing in common with the popular rights, and that those who have exercised the Crown rights have had no disposition to exercise them in the 'spirit' in which they should have been exercised. Had this been done, Epping Forest might have been saved years ago, without the large expenditure of money which has been needed to defend the public rights and resist enclosures.

The chief recommendations of the Select Committee of the House of Commons on the subject of the New Forest are as follows: 'The New Forest shall remain open and unenclosed, except to the extent to which it is expedient to maintain the existing right of the Crown to plant trees.' The ancient ornamental woods 'shall be carefully preserved, and the character of the scenery shall be maintained.' This is a most important recommendation, and it will doubtless serve effectually to dispel the public apprehension concerning the proposed destruction of the sylvan loveliness of the New Forest. The committee further recommends that 'powers of enclosure, conferred by statute, shall be exercised only on that area which has hitherto been taken, at various times, and been either kept or thrown out by the Acts of Parliament already alluded to as sanctioning the existing enclosures.' The committee also suggests that the Crown shall retain the power of keeping 16,000 acres of growing timber and trees, planted under the Acts of William III. and of 1851, 'at all times under enclosure;' and further 'that the Crown be entitled to enclose, and throw out at will, any portion of the area over which the powers of planting are to be exercised, with a view to its unrestricted use, in such manner as may be deemed expedient for the most profitable growth of timber and trees.' The popular recommendation is also made that 'the verderers' court be reconstructed, so as better to represent the commoners, and to have the power to regulate the exercise of the commoners' rights over the forest, and to appoint officers, in order to prevent encroachments upon them.' But provi-

sion is to be made so that, 'in the event of any future severance of interests in the forest between the Crown and the commoners, the limitations now proposed to be placed on the exercise of the rights of the Crown shall in no way prejudice the claims of the Crown.' Altogether, we think the public will have no reason to be dissatisfied with the recommendations of the Select Committee on the New Forest, for they will remove the fear which was entertained that this beautiful woodland was doomed to destruction.

The Health of Watering Places.

XV. SCARBOROUGH.

THE municipal and parliamentary borough of Scarborough has an area of 2,348 acres, and consists of the entire townships of Scarborough and Falsgrave. These two townships were credited at the first national census in 1801 with a population of 6,688 persons, which in 1831 had increased to 8,760. In 1841 the population therein enumerated was 10,060, in 1851 the number was 12,915; it had increased to 18,377 in 1861, and to 24,259 in 1871. During the ten years 1851–61 the increase in the population of Scarborough borough was equal to 42·3 per cent., and in the following decade, 1861–71, to 32·0 per cent. If the rate of increase of population within the borough which prevailed between 1861 and 1871 has since been maintained, the population may be estimated at 26,550 in the middle of 1874, and at 27,298 in the middle of this year.

The registration sub-district of Scarborough, which is taken by the Registrar General in his annual table to represent this watering place, also includes a rural area of 17,408 acres, comprising seven townships, which had a population of 2,090 persons in 1861, and 2,136 in 1871. The inclusion of this rural and almost stationary population of about 2,000 persons, makes scarcely any appreciable difference in the calculated rate of mortality. After due correction for the deaths in public institutions the rate of mortality during 1874 was equal to 17·5 per 1,000, both in the entire registration sub-district taken by the Registrar General to represent this watering place, and within the correct boundaries of the borough. In order that we may estimate the approximate accuracy of the estimate of the present population of Scarborough, it will be useful to notice the recorded birth-rate in the town in recent years.

During the ten years 1861–70 the annual birth-rate in Scarborough sub-district averaged 36·4 per 1,000; in the four years 1871–4 the birth-rate was successively 31·6, 33·1, 30·2, and 30·0. Thus the birth-rate in those four years averaged only 31·2 per 1,000, which shows a decline of no less than 5·2 from that which prevailed in the preceding decade. Dr. Taylor, the medical officer of health for Scarborough, in his report upon the sanitary condition of the borough during 1874, publishes a table from which we have been able to calculate that the birth-rate within the borough was 32·0, 33·2, 30·2, and 29·9 successively during the four years 1871–4. These birth-rates throw some doubt upon the estimate of population based upon the supposition that the rate of increase which prevailed between 1861 and 1871 has since been maintained. It may be safely concluded that the population is not underestimated, even if the apparent decline in the birth-rate may not be taken as evidence that the rate of increase which prevailed between 1861 and 1871 has not been maintained. The births registered within the borough during the four years 1871–4 averaged 798 per annum, against 838 in the preceding six years. It is unusual to find an actual decline in the number of births registered in an increasing population, and therefore it appears probable that the present population of Scarborough is somewhat over-estimated, although the limit of error is scarcely large enough materially to affect the value of the conclusions we propose to base upon a critical examination of the recent mortality statistics of the borough.

The average annual rate of mortality from all causes in Scarborough sub-district during the ten years 1861–70 was 23·1 per 1,000, after correction for deaths in institutions, that is, after the exclusion of the deaths of paupers in the union workhouse, who had been admitted to that institution from other parts of the district or union. No correction appears to be necessary on account of deaths in the other institutions situated in the borough, as but few deaths are recorded in the Royal Northern Sea-bathing Infirmary, the Cottage Hospital, or the Sanatorium, and most of these are probably of inmates admitted from the borough. The correction for ex-municipal workhouse deaths reduces the average annual death-rate in the sub-district during the ten years 1861–70 from 23·4 per 1,000 to 23·1, as stated above. During the four years 1871–4, the annual death-rate in the sub-district, after a similar correction for deaths in the workhouse, was 24·9, 19·9, 18·5, and 17·5 respectively; thus, the death-rate showed a steady decline during these four years, and averaged 20·2, which was 2·9 per 1,000 below the rate in the ten preceding years. These rates for the entire sub-district differed but slightly from those calculated for the borough, as we have seen that the inclusion of the rural population of about 2,000 persons in the sub-district causes its death-rate to vary but slightly from that in the borough. Having thus used the figures for the sub-district to trace the recent decline of mortality in Scarborough during a series of years, we will now proceed to discuss in greater detail the recent figures for the borough.

During the year 1871 the deaths registered within the borough of Scarborough were 609, whereas they declined in the three succeeding years 1872–3–4, to 523, 500 and, 472 respectively. This steady decline in the number of deaths (the deaths in 1874 were 22·5 per cent. less than in 1871) during the past four years undoubtedly signifies a decrease in the rate of mortality. The 472 deaths in 1874, after the deduction of eight of ex-municipal paupers in the workhouse were equal to a rate of 17·5 per 1,000, against 24·6, 20·5, and 19·1 in the three preceeding years after similar correction for the deaths of ex-municipal paupers. These recent rates may be slightly under-stated by an over estimate of the population; but it is beyond dispute that the rate of mortality has markedly declined since 1871, and that it was satisfactorily low both in 1873 and 1874.

The deaths registered within the borough during 1874 included nineteen which were referred to diarrhœa, five to scarlet fever, five to other forms of fever, four to whooping cough, two to diphtheria, one to measles, and not one to small pox; in all thirty-six deaths resulted from these seven principal zymotic diseases, corresponding with the number from the same diseases in 1873. These thirty-six zymotic deaths in 1874 were equal to 7·6 per cent. of the deaths from all causes, and to an annual rate of 1·4 per 1,000 of the 26,550 persons estimated to be living in the borough at the middle of the year. During the ten years 1861–70 the average annual death-rate in the registration district or union of Scarborough from these seven diseases was so high as 4·2 per 1,000, although the district includes a considerable rural area and population in addition to that of Scarborough borough and sub-district. During the four past years, 1871–4, this zymotic rate in the sub-district has been successively 5·7, 3·3, 1·4, and 1·5 per 1,000. It appears that in 1874 the zymotic rate was rather higher in the entire sub-district than in the borough, which affords conclusive evidence that the deaths referred to those diseases were proportionately more numerous in the ex-municipal part of the sub-district than in the borough itself. This suggests the desirability of some arrangement by which the rural parishes around Scarborough might be placed within the control of the sanitary organisation of the borough.

Among the fourteen English watering places, the statistics of which have previously been discussed in detail in these columns, the percentage of deaths from these

seven diseases to total deaths in 1874, which, as we have just stated, was equal to 7·6 in Scarborough borough, ranged from 5·6 and 8·0 in Eastbourne and Llandudno, to 27·7 and 28·8 in Weymouth and Yarmouth, in both of which scarlet fever was fatally prevalent in 1874. The death-rate per 1,000 of the population from these diseases, which was 1·4 in Scarborough, ranged in the fourteen other watering places from 0·9 and 1·4 in Eastbourne and Llandudno, to 5·7 and 6·4 in Weymouth and Yarmouth. Thus, judged by the death-rate from the principal zymotic diseases, Eastbourne was the only one of the fifteen watering places which gave evidence of more satisfactory condition than Scarborough during 1874.

Of all the zymotic diseases, the forms of fever including typhus, typhoid or enteric, and simple continued fever, are perhaps by more general consent pronounced to be most directly influenced by the sanitary condition of the population. In Scarborough sub-district twenty-one fatal cases of fever were registered in 1871, in 1872 only ten were recorded, and both in 1873 and 1874 the number did not exceed six. This marked decline in the fatality of fever in Scarborough affords the strongest evidence of the improved sanitary condition of the borough. The five deaths from fever in the borough in 1874 included two of typhoid fever in North Street and Albemarle Crescent in the second quarter of the year; one each of cerebro-spinal fever and simple fever in the third quarter, which occurred respectively in West Place and Lower Nelson Street; and one of simple fever in North Marine Road, which was recorded in the last three months of the year. Scarlet fever caused fourteen deaths in Scarborough sub-district in 1871, not one in 1872, four in 1873, and six in 1874; of the latter number six occurred within the borough, including four in the first quarter of the year. Whooping-cough caused fourteen deaths in the sub-district in 1871, only one during 1872 and 1873, and six in 1874; of the latter six only four were returned within the borough, one each occurring in the March and June, and two in the last quarters of the year. Two fatal cases of diphtheria occurred within the borough during the third or summer quarter of 1874, in North Marine Road and Filey Road; diphtheria was somewhat fatally prevalent during 1871, since which only a few isolated cases have occurred. No death was referred to measles in 1871, six in 1872, not one in 1873, and only one in the latter part of 1874. Small-pox was severely epidemic in Scarborough during the latter part of 1871 and early in 1872, causing 106 deaths; no death has, however, been referred to this disease since the end of 1872. Although, unfortunately, the responsibility as to the carrying out and the due efficiency of vaccination rests with the guardians instead of the various sanitary authorities, it appears eminently desirable that medical officers of health should be duly informed as to the proportion of the population under their sanitary superintendence which remains unprotected by vaccination, and we are always glad to see this subject alluded to in local sanitary reports. We do not, however, observe any reference to vaccination in Dr. Taylor's reports for Scarborough, although the liability of the town to the scourge of another small-pox epidemic depends in great measure upon the number of unvaccinated persons contained in its population. Vaccination is sometimes apt to be neglected when the dreaded disease is out of sight. When small-pox is epidemic, vaccinated persons sometimes suffer, though far less severely; we know, however, by experience that an outbreak almost invariably appears first among the unvaccinated. To diarrhœa nineteen deaths in the borough were referred during 1874, showing a decline of five from those returned in 1873; seventeen of these were of infants under one year of age, and twelve occurred in the third or summer quarter of the year, being equal to an annual rate of 1·8 per 1,000 during the three months. No death was referred to diarrhœa in Eastbourne during the summer quarter of 1874; while in the other watering places dealt with, the annual death-rate from this disease during the same period ranged from 0·9 and 1·2 in Llandudno and Hastings to 3·5 and 4·9 in Lowestoft and Margate. The diarrhœa rate in Scarborough was considerably below the average rate in the fourteen other watering places.

It will be useful to briefly notice the mortality in Scarborough during 1874 from phthisis and from diseases of the respiratory organs, to which forty-one and seventy-one deaths were respectively referred. It is not probable that the rate of mortality from these diseases in Scarborough is much disturbed by the deaths of visitors, as is the case in Hastings, Ventnor, Torquay, Southport, and other watering places which have become favourite resorts for phthisical and other confirmed invalids. The annual death-rate from phthisis in Scarborough during 1874 was equal to 1·5 per 1,000, whereas in the other watering places it ranged from 0·9 and 1·3 in Llandudno and Lowestoft, to 3·0 and 3·3 in Southport and Rhyl. The Scarborough death-rate from diseases of the respiratory organs was 2·7 per 1,000; in the other towns it ranged from 1·8 in Worthing and 2·4 both in Lowestoft and Folkestone, to 3·2 and 3·6 in Llandudno and Dover. Dr. Taylor, in his report for 1874, gives the cause of death in each of the eighteen cases of deaths of visitors during the year; these included but two of phthisis and one of pneumonia, so that the death-rates from these diseases given for Scarborough fairly represent those among the resident population. It is a satisfactory feature of the Scarborough mortality statistics to find the death-rate from phthisis not only considerably below the average rate in all England, but also far below the average rate in nine other watering places for which similar figures have been obtained.

Infant mortality has long been recognised as one of the most useful and reliable tests of the sanitary condition of a population. On account of certain imperfections in the census enumeration of the ages of young children, infant mortality is most satisfactorily measured by the proportion of deaths under one year to births registered. Infant mortality in Scarborough borough during 1874, measured in this manner, was equal to 153 per 1,000; in the sub-district it was equal to 200, 158, 159, and 157 per 1,000 respectively during the four years 1871-4. It appears that infant mortality, as well as the fatality of zymotic disease, was higher in the ex-municipal portion of the sub-district than in the borough. Infant mortality in the whole of England and Wales during 1874 averaged 151 per 1,000, and was therefore slightly below the rate in Scarborough, which has been remarkably stationary during the past three years. In the fourteen other watering places, previously referred to, this rate of infant mortality ranged upwards from 95 and 98 in Worthing and Llandudno, to 180 and 187 in Rhyl and Southport. Although the Scarborough rate of infant mortality bears favourable comparison with that in most large towns and very many small ones, it is undoubtedly excessive, and we are glad to observe, from Dr. Taylor's two last annual reports, that the subject has received considerable attention in Scarborough, and that the town possesses a well-conducted *crèche* or day-nursery, in which infants and children under the age of three years are received and tended. This institution is principally used during the visitors' season, when probably the mothers are more continually engaged away from home. The usefulness of such an institution from a sanitary point of view is undoubted, and when the working classes can be induced more generally to use it, an appreciable effect upon the rate of infant mortality will probably be noticed. The 122 deaths of infants under one year of age in Scarborough during 1874 included twenty-one from zymotic diseases, two from syphilis, fourteen from mesenteric disease, hydrocephalus, and scrofula, thirteen from diseases of the respiratory organs, thirteen from premature birth, and forty-six from the somewhat indefinite causes—thrush, convulsions, atrophy, and debility.

Of the terribly high rate of infant mortality among illegitimate children very little is definitely known. It is generally, however, at least double that among infants born

in wedlock. The Birth and Death Registers afford almost the only means for efficiently carrying out the provisions of the Act for the 'Better Protection of Infant Life,' and it is highly gratifying to find that at any rate in Scarborough those means of detecting 'baby farming,' and of observing the fate of illegitimate children is turned to account. In Scarborough sub-district during 1874 the illegitimate births registered were seventy, or rather more than eight per cent. of the total births; no less than thirty-four deaths of illegitimate infants under one year of age were registered, so that the rate of infant mortality among these 'unfortunates' was equal to 48·6 per cent., whereas among legitimate children it was only 12·8 per cent. We have said that 8 per cent. of the births were illegimate, but in consequence of the terrible mortality among illegitimate infants they formed 29 per cent. of the deaths registered among children under one year of age. On other than mere sanitary grounds we strongly commend this subject to the continued notice of the medical officer of health and of the philanthropic, especially among the ladies of Scarborough. A proper use of the Birth-register may not only be made the means of saving much innocent infant life, but by timely and judicious assistance to erring mothers save them from lives of degradation and sin, and from adding to their previous faults the crime of indirect infanticide.

By assuming that the age distribution of the population of Scarborough is proportionately the same now as it was in 1871, when the last census was taken, it may be estimated that in the middle of 1874 there were 2,184 persons living in the borough aged upwards of sixty years, and as 140 deaths at these ages were registered during the year, the death-rate was equal to 64·1 per 1,000. The average death-rate at these ages in the whole of England and Wales in 1874 was 72·0 per 1,000, and in the fourteen other watering places it ranged from 56·4 and 56·6 in Weymouth and Lowestoft, to 70·9 and 79·1 in Lowestoft and Rhyl. The death-rate among elderly persons in Scarborough was 7·9 per 1,000 below the general English rate in 1874, and differed but slightly from the average rate in the fourteen other watering places.

The value of the Scarborough Death-register is somewhat impaired by the unsatisfactory manner in which the cause of death is returned in inquest cases. The verdict in six cases within the borough during 1874 was returned as 'Visitation of God,' and was so entered in the Death-register as the cause of death! Instead of the cause of death being elucidated by the inquest in these cases, it would have been more definitely described by an ordinary medical certificate.

We will now briefly refer to the mortality statistics for the first half of this year. During the first quarter of 1875 the health of the town suffered, as elsewhere, from the severity of the weather, and the annual death-rate was equal to 23·5 per 1,000; in the second quarter ending June, the death-rate declined to 15·6 per 1,000. Apart from the effect of the low temperature during the first three months of the year, the zymotic death-rate showed a considerable increase, and according to the Registrar General's Quarterly Return the rate from the seven principal diseases of this class rose to 2·8 per 1,000 in the sub-district, owing principally to the fatality of fever and whooping-cough. Of eight deaths referred to fever in the first three months of this year two occurred in Westfield Mews and two in Newborough Street; these localities have doubtlessly engaged the attention of the medical officer of health. The medical officer's return for the June quarter, however, was a very satisfactory one, as of 105 deaths registered in the borough only seven, or 6·7 per cent. were referred to the seven principal zymotic diseases, including three from whooping-cough, two from diarrhœa, and one each from typhoid fever and diphtheria. The fatal case of typhoid fever occurred in the Union Workhouse, and had been admitted from Filey. Three deaths from these causes occurred in the rural ex-municipal portion of the sub-district.

It is desirable that some reference should be made to the fact that Dr. Taylor, the medical officer of health for Scarborough, in calculating the death-rate for the borough makes two corrections: for deaths of paupers in the workhouse who have been admitted from ex-municipal portions of the union, and also for the deaths of visitors. With regard to the correction for workhouse deaths, whether it be necessary to add or to deduct them from the deaths registered in the district for which it is desired to calculate a death-rate, there can be no question as to the propriety of the operation, and provided that the necessary information be obtained from the workhouse there is no difficulty in carrying it out. The question of correction for deaths of visitors is, however, a far more complex one, and there is much to be said both for and against such a correction. It is very possible that at the time of the census enumeration very few visitors may have been counted at Scarborough, Southport, Llandudno, and other northern watering places, whereas thousands may have been included in the population of Hastings, Bournemouth, Torquay, etc., on the south coast; and for this very reason it may be justifiable to exclude the deaths of visitors in the northern places, whereas they should be included with the returns for the southern places. It is impossible, however, to decide how many visitors were enumerated in the several watering places in 1871, and therefore impossible to decide which places should and which should not exclude the deaths of visitors. Again, if the practice of deducting the deaths of visitors were generally adopted in the preparation of reports upon watering places, the very elasticity of the term 'visitor' would create much distrust as to the value of such statistics. If some satisfactory definition of a 'visitor' could be devised it would be desirable that such information should be added to the death register. But what form should this addition take? The birth-place is no guide to natural residence, neither is length of residence a safe test. A population, like that of most watering places, which increases far more rapidly than the excess of births over deaths, must always include a considerable number of recent residents, whose deaths should be debited to their new district, as they themselves are counted in its population. Dr. Taylor states that in Scarborough twenty-eight deaths of visitors occurred in 1873 and eighteen in 1874. The effect of excluding these deaths of visitors is to reduce the rate of mortality in 1873 from 19·2 to 18·3; and in 1874 from 17·5 to 17·1. We are certainly of opinion that so slight a correction is scarcely worth making at the risk of justifying a charge of unfair manipulation of figures. Until some attempt is made to distinguish the deaths of visitors in the Death-register, corrections for their deaths must always be taken on trust, which is not always readily given by those interested in rival watering places. We would venture to suggest that in future, at all events until this vexed question is decided, Dr. Taylor should publish the death-rate in Scarborough without the deduction of the deaths of visitors, although it cannot but be useful that he should also state what the rate would be calculated without these deaths.

As the result of this careful examination of the recent mortality figures for Scarborough we can most thoroughly endorse the opinion expressed in Dr. Taylor's last annual report, that the 'increasing attention given to sanitary matters has been the means of causing the diminished rate of mortality.' That the sanitary condition of the borough, whether judged by the death-rate from all causes, from zymotic diseases, and especially from fever, or by the rate of mortality among infants or elderly people, has markedly and steadily improved since 1871, there can be no manner of doubt. The natural advantages of climate and situation enjoyed by Scarborough, which are dwelt upon at some length by Dr. Taylor in his annual reports were, of course, the same before 1871 as since, and have little bearing upon the improvement which has recently taken place in the health of the people, although they have probably rendered that improvement easier of accomplishment. A

word or two, in conclusion, may not, however, be out of place as to the water-supply, drainage, and one or two other matters with which the sanitary condition of a town population is most intimately connected.

The water-supply is obtained from a natural spring which issues from the oolite on the side of the cliff at Cayton Bay; it is pumped into a reservoir with a capacity for 3,000,000 gallons, from which it is supplied on the constant system, to every part of the town by gravitation. Professor Attwood, F.S.C., of London, as the result of an analysis of two samples of the Scarborough water, recently certified 'that it compares favourably with the better varieties of potable water supplied to the chief cities and towns of Great Britain.' It appears, therefore, that there is no reason to doubt the excellent quality of the Scarborough water, and when all the houses in the borough are supplied with it, which was not the case at the end of last year, no anxiety need be felt on the score of this essential to health.

The drainage area of the borough consists of about 900 acres, in which there now exists a total length of more than twenty-three miles of main sewers. In the beginning of 1872 the sanitary arrangements of Scarborough were thoroughly inspected by Mr. Bazalgette, C.E., who, among other things, recommended a complete and extensive system of sewer ventilation. In pursuance of his advice, ventilators were formed at the upper ends of all the branch sewers, and at distances not exceeding an eighth of a mile throughout the main sewers. These ventilators were mostly carried by six-inch pipe tubes to the tops of the houses, away from chimney pots and windows. At the end of 1874 there were more than 200 of these ventilating shafts within the borough of Scarborough, situated at an average distance of about 200 yards apart; it is proposed from time to time to add to their number, thus rendering the ventilation of the sewers as nearly complete as possible. There are few towns in which this important matter has received so much attention, and has been so satisfactorily dealt with as in Scarborough. There are, moreover, open ventilators all along the foreshore to obviate the possibility of the sewer being tide-locked, which in so many watering places drives the sewer gas back into the houses; and, in addition to the shafts there are about forty open ventilators either in the main sewer or in the branches near the main.

The urban sanitary authority possesses hospital accommodation for the treatment and isolation of cases of infectious diseases, which was erected four years ago, at the time of the small-pox epidemic. This building, now known as the Sanatorium, will accommodate forty patients, is fitted with all the necessary appliances, including Nelson's stoves for the disinfecting infected clothes, bedding, etc.

Dr. Taylor's reports do not contain any reference to the nature of the dwellings used by the poorer of the working classes in Scarborough; but should any of these be of a character prejudicial to the health of their inhabitants (we observe that several deaths from zymotic diseases occurred in 1874 in Hall's Yard, Westfield Mews, etc), it will be well to remember that the provisions of the recent Artisans' Dwellings Bill are applicable to Scarborough.

On the whole, there is abundant evidence that a due appreciation of the value of health and sanitary reputation has recently prevailed in Scarborough, which has already resulted in a marked improvement in the sanitary condition of the town, judged by the evidence of its mortality statistics. A continuance of the same earnest efforts for sanitary progress will undoubtedly render Scarborough one of the very healthiest of our healthy watering places.

An early account of Scarborough tells us that 'the double attractions of sea bathing and of mineral waters which this place possesses render it much superior, though not so fashionably frequented as many others. The sons of pleasure fly to more genial climes, and court the breezes of the south; and except those who are allured by connections, and swayed by local considerations, Scarborough contains more votaries of health than of dissipation.'

In most respects things are greatly changed now-a-days. Scarborough is in autumn essentially the resort of the gay and idle, while it nevertheless keeps up a strong local connection with Yorkshire and the north of England, and has among its 200,000 annual visitors (for to that enormous number have they grown), but a limited number of those who are really in quest of health. It is in fact probably the most crowded watering place in England.

It is also certainly the most imposing in its general effect, stretching along the curve of the bay to that noble headland, the castle rock, which screens it from the north, and very slightly from the east, and extending along the coast to the north of the castle. It has everywhere fine firm sands, running out so far that bathing may be carried on in any state of the tide, and almost in any weather. It need scarcely be said that there is an ample supply of bathing machines, and that there are excellent baths in Sandside, and in other portions of the town. The air of Scarborough, as of all this coast, is bracing, and is strengthening to the great majority of invalids; a few complain of its being too strong. The rainfall, though much less than in the corresponding latitude on the west coast, is somewhat greater than in Norfolk.

The great centre of life at Scarborough is the Spa promenade, extending from the magnificent bridge which spans the valley between the old and new towns. It runs along the edge of the sea, from which it is separated by the sea-wall, and terminates at the handsome saloon, pavilion, and music hall which are just beyond the Spa. A band usually plays twice a day in the pavilion.

The Spa contains two wells, which are at the north end of the promenade, a few yards from each other, and close to the sea. They are in a sort of pit, to which you descend by steps, with walls lined with solid masonry. The water drops from tubes into small circular basins, and there are glasses which visitors can fill with the water. The waters are chiefly a very weak mixture of Epsom salts and of iron with a little common salt and water. They contain in the pint

	North well. Grains.	South well. Grains.
Common salt	3·3	3·7
Epsom salts	17·8	28·1
Sulphate of lime	13·0	13·8
Carbonate of lime	6·0	6·0
Protoxide of iron	0·23	0·23

In short, the water is a weak Cheltenham, or a slightly aperient chalybeate, the south spring being the more distinctly laxative. The operation of the waters corresponds with their chemical constitution; both are alteratives and both contain iron; either of them will supply the system with a small quantity of iron, and you have an aperient action if you use the south well. It should be added that Dr. Sheridan Muspratt's analysis makes the difference in sulphate of magnesia of the two wells much less than what is given above. In fact, his analysis makes the two waters identical for all practical purposes.

The south well acts gently on the bowels and kidneys, sometimes on both, and its action is not depressing. It has been employed mostly in dyspepsia and struma, and has also had a reputation in skin-diseases. In days when people were perhaps more free spoken than now, Dr. Shaw enlarged on the great safety and advantage wherewith the Scarborough well-water was freely drunk the next day after the plentiful or immoderate use of wine or other spirituous liquors, correcting the acid which such liquors are apt to leave behind in the stomach, so as to overcome nausea, sickness, the heartburn, and headache. It was to the lime present that he attributed these corrective virtues, which also he thought made the waters useful in constitutional affections of children for which powdered shells used to be given much in the same way as phosphate of lime is now. The Scarborough water, and more especially the north well, or a mixture of the two, is often of use in chlorosis and in affections of the female system.

Used steadily, in doses of two or three half pints daily, it has been found useful in habitual constipation. Indeed, the late Dr. Granville suggested that they might conveniently supplement a course of the more powerful Harrogate waters. Gout, rheumatic gout, and scrofula improve wonderfully at Scarborough, but these effects are mainly owing to the excellence of the air and to hot and cold sea-bathing, for but a small percentage of visitors or patients take the waters.

The original account of these waters, published by Dr. Wittie in 1667, extols them above any foreign spas; he gives full instructions for drinking them, and advises that the patient, in the interval of drinking his glasses, should chew some carminative tablets or peptic powder, and in the case of paupers, who must be content with something less costly, some carraway seeds to strengthen the ventricle. He also argues against the popular error, that it was not safe to drink these or any other mineral waters during the dog days; he further gives minute directions about diet, as foreign doctors do now. It need be scarcely said that in those days the waters were efficacious in a great many more complaints than they are now. The list included scurvy, inveterate quartans, epilepsy, dysentery, sterility, stomach affections, obstructions, and dropsy—nay, they were even considered a sovereign remedy against stone. But there were violent differences of opinion on this subject.

Besides the Spa promenade, Scarborough offers to its visitors a fine jetty running out in to the sea to the north of the Castle, where a band plays, and the people's park in the valley between the new and old towns.

It is unnecessary to enumerate the public institutions, but we must not omit to mention the Sea-bathing Infirmary, which was founded in 1812, and which contains seventy-seven beds.

Scarborough has assemblies, and races, and boating, and its monster hotel. Sea-fishing may be had, or trout fishing a few miles off in the Derwent, the main branch of which rises not far from the sea, but flows inland. There is most interesting broken country in the interior, and there are fine bays on the coast, described in all guide books. The railway now in construction to Whitby will render all these places more easy of access, and as its prospectus says, will open up the almost unknown scenery of the neighbourhood. Hayburn Wyke, with its noble headland; Blea Wyke, the undercliff of the Yorkshire coast; the lofty cliffs around Peak, some six hundred feet high above the German Ocean, commanding the whole extent of Robin Hood's bay; Fylingdales, with their romantic becks enclosed by the escarp of Stort-Howe—all these are among the number of the fine natural objects of the district; but many of them are nearer to Whitby, which we shall next visit, than to Scarborough.

Law Reports.

UNWHOLESOME FOOD.

DR. GRIFFITH, the medical officer of health for Sheffield, reports that frequent seizures of unwholesome provisions have taken place during the year. The prompt action taken has acted as a useful caution in several instances, and the penalties inflicted served the desired end in restricting the traffic in diseased meat and other articles. The fines imposed during the year have amounted to 372*l.* 5*s.*, which sum has been added to the borough fund.

THE ANTI-VACCINATION AGITATION.

AT Kildwick, in the West Riding, there has been a strange demonstration. T. Harrison, shoe manufacturer, had been fined by the Skipton magistrates 20*s.* and costs for refusing to have his child vaccinated. Although well able to pay, he went to prison for twenty-eight days. On his release from gaol, he was met at Kildwick Station by several hundred anti-vaccinationists, many of them from Keighley, the head quarters of the movement, who received him with great enthusiasm. A procession of carriages with a brass band and banners was formed and marched to Glusburn, where speeches on the subject were delivered. Part of the proceedings consisted of the burning in effigy of Sir M. Wilson, member for the North West Riding, whose opposition to the movement has brought upon him the opprobrium of these fanatics.

PROCEEDINGS AGAINST A TRAMWAY COMPANY.

AT Worship Street, J. Joscelyne and J. Miller, scavengers in the employment of the North Metropolitan Tramways Company, were summoned by the Vestry of St. Leonard, Shoreditch, for throwing mud in the carriage-way. Mr. Walker, clerk to the vestry, prosecuted, and Mr. Godfrey defended. He said that the defendants, who were only nominally the offenders, would plead guilty; but on behalf of the company he wished it to be understood that the matter complained of was unintentional. Mr. Walker explained that the men were sent out to clear the mud from the tramrails, and then it was thrown into the road and left a nuisance to the public. The matter had some time ago been tried in this court and the company fined. Mr. Cooke fined the defendants 5*l.* each on the first summonses against them, the second summonses being withdrawn. The company paid the money.

BRIEF NOTES OF CASES.

CONTRACTS UNDER SEAL.

1875. *Wells* v. *Kingston-upon-Hull, Mayor.*—Circumstances under which a contract with a corporation need not be under seal. (L. R. 10, C. P. 402.)

HIGHWAY OBSTRUCTION.

1875. *Spice* v. *Peacock.*—Obstruction of a partly paved footway by goods exhibited for sale.—Held that the magistrate was right in convicting the appellant. (39 J. P. 52.)

RATING OF PUBLIC BUILDINGS.

1875. *London, Mayor* v. *Stratton.*—Poor rate.—St. Thomas's Hospital held rateable on the authority of *Jones* v. *Mersey Docks.* (W. N., 1875, p. 42.)

SURETY.

1875. *Hawkins* v. *Aldershott School Board.*—Contract by builder.—Bankruptcy of builder.—Substituted contractor.—Liability of original surety. (*Times*, April 22, 1875.)

ADULTERATION OF FOOD.

1875. *Gibson* v. *Leaper.*—'Adulteration of Food Act, 1872,' sections 2, 3. Delivery to a purchaser of packet of prepared cocoa labelled to the effect that it was a mixture held no offence within the Act.—Conviction quashed. (*Times*, June, 1875.)

AUDIT.

1875. *Gibson* v. *Bell.*—Public Health Act, 1872,' section 7. Local Act.—Held that sanitary accounts under Local Acts must be audited by the poor law auditor, 39 J. P. 421.

BY-LAWS UNDER THE PUBLIC HEALTH ACT, 1875.

SIR,—I see it stated in the *Justice of the Peace* that all existing by-laws under the old 'Sanitary Acts' must now be deemed superseded, and that new ones must be prepared by every local board in England. Surely this cannot be the case? RUSTICUS.

[Of course not. It is difficult to comprehend how such an opinion could have been arrived at. Section 326 of the new Act expressly saves all existing by-laws, not directly inconsistent with the new Act.]

DILAPIDATED HOUSES IN RURAL DISTRICTS.

SIR,—In the rural sanitary district of which I am inspector of nuisances, there are two or three very old and dilapidated houses, uninhabited, adjoining the public highway, which, I fear, will fall to the ground, and may injure any person who should be passing at the time. What proceedings must I take against the owner to have the houses either properly repaired or pulled down?' T. T.

[As a rural sanitary officer T.T. does not possess those powers which, from his question, he seems to infer that he possesses. Were he dealing with an urban district he would obtain his powers from section 160 of the 'Public Health Act, 1875.']

RIVER POLLUTION BY MANUFACTURING REFUSE.

SIR,—In my district (rural) there are several streams a few years ago free from contamination which have recently become polluted by tanneries, the chief pollution being lime. This entirely prevents the water being used for farm purposes, viz., drinking water for cattle and the washing of potatoes, etc. This has been the subject of complaint on several occasions by the various farmers through whose land the streams run, and I have advised the authority that as the water is not used for drinking or domestic purposes, the parties who sustain the injury should by an action at law proceed against the parties who pollute the stream. Will the present state of the law allow me to do more? The owners of the tan-yards can easily prevent the lime from polluting the streams. Should I be right in recommending the authority to compel them?

I should be much obliged if you will give me your advice on this matter in your next journal.

JOHN H. CORNALL.

[We think our correspondent has given good advice, and that under the circumstances it is not desirable for either him or his board to interfere further in the matter.]

THE UNION OF SANITARY AREAS.

SIR,—I hope that further consideration will be given to the question of what shall be the limit of population for the union of small parishes for civil purposes. The number of 100, fixed by the Government bill, is assuredly much too low. I must confess that I do not think that the figure of 300, discussed by the committee, would have been too high. At any rate, if the circumstances of my county (Sussex) afford any clue to the state of things prevailing in other counties, I would put in a strong plea in favour of the number 200. I have counted up from the census the parishes in this county which have less than 200 population, and I find no fewer than eighty-one, and these would become 109 were the limit put up to 300. The existence of so many small areas is, for civil purposes much to be deprecated. These figures involve 109 overseers and 109 guardians to manage no more than about 10,000 persons. Let it be remembered that it is not alone for poor-law purposes we have to legislate; other important administrative matters are affected on the side of public convenience by the consolidation of existing local areas—especially, for instance, the registration of Parliamentary voters and the formation of jury lists.

There is one other matter of a practical character arising out of this subject which, in the interest of enlightened progress, I would dwell upon. The more small parishes that can be got rid of for the election of guardians, the greater the number of stick-in-the-mud farmers we shall get rid of, whose seats can thereupon be awarded to larger parishes likely to choose a better type of men as guardians.

I am, etc.,

Temple, July 19, 1875. GEORGE F. CHAMBERS.

Correspondence.

[*We do not necessarily endorse the opinions of our correspondents by the publication of their letters.*]

MR. A. HAVILAND ON THE GOUX SYSTEM.

(*To the Editor of the* SANITARY RECORD.)

SIR,—Since the publication of a brief abstract of my report to the delegates of the combined sanitary authorities in Northampton and the adjoining counties on the Goux system of sewage disposal, based on my visits to Aldershot and Halifax, I have received so many letters on the subject from medical officers of health, sanitary authorities, and others interested in keeping their towns and villages free from sewage filth and their wells from sewage pollution, that I feel it quite impossible to reply to them. I, therefore, crave a space in your columns in order that I might briefly express my opinion as to the efficacy of the system in question in meeting the difficulties which surround medical officers of health, sanitary authorities, and private individuals directly they are called upon to deal with sewage.

Having been favourably impressed with the principle of the Goux system, which I saw in operation at Aldershot in October last, I was anxious to investigate it further, and for this purpose visited Halifax in March last in company with Dr. Goldie, the medical officer of health for Leeds. Halifax, at the census of 1871, contained 13,970 houses and 65,510 persons. It is situated between high hills, and its site is so irregular that many of its main streets and roads are particularly ill-adapted for the draught of heavily laden vehicles, so that scavenging on a large scale is performed under greater difficulties than perhaps in any other town in England.

We were first taken to the manure shed, where the sewage is taken direct from the houses—a building 145 feet long and 74 feet wide, roofed with wood and felt, with open rafters, it contained 1,500 cart loads of manure, from the fresh contents of the tubs to the ripe manure fit for the field. There was no real sewage smell although ammonia was perceptible, not unpleasantly, however; the odour of the atmosphere resembled that of a well kept cowshed.

In Halifax the lining of the tubs is shoddy, at Aldershot stable litter. A lad lined six tubs and prepared them for use in two minutes.

The company supply in the borough 3,020 closets with tubs—a fifth more is kept in reserve. About 550 tubs are emptied daily into the shed, twenty-one being a load. Scavenging begins at 7 A.M. and ends at 5.30 P.M. Occasional complaints have been made of the smell of the tubs, but these have only occurred when the emptying has been neglected, and the tubs allowed to get too full, as was the case during the severe parts of this year, when the horses could hardly stand on the slippery hills of Halifax, and the scavenging could not proceed at the usual rate. The tubs are emptied once a week.

Penalties are enacted if a nuisance arise during the scavenging, as for instance when there are droppings from the carts. In two cases only have proceedings, however, been taken, the one resulting in conviction and the other in dismissal.

The sewage is emptied directly into the shed; it heats like stable dung. At the depôt the manure sells at 11*s.* per ton, and 2*s.* extra for carting to the station, which is about a mile off. It is then conveyed in open trucks by railway to its destination.

Only one complaint has been made as to the smell arising from these trucks, which are loaded at the ordinary goods station. The carriage is sometimes paid by the Goux Company, and sometimes by the consignee, credit being given to the company.

Sir Titus Salt had 200 tons last year, and at the time of my visit was having delivered 100 tons more.

In the work twenty-one men are employed and eighteen horses, ten belonging to the company and eight hired. As to the health of the men employed, not one had lost a day's work from sickness for the last two years. The Goux system was established in Halifax in January, 1870. The manure, which in a fresh state sells at 11*s.* per ton, in the manufactured, *i.e.*, when mixed with gypsum, soot, charcoal, and other fertilisers, realises 4*l.* 10*s.* per ton, and is delivered to farmers for this sum, which includes carriage and bags. In this state it resembles garden leaf mould. Dr. Goldie compared it to the Lierneur poudrette.

The company collects ashes for admixture, this item alone costing 17*l.* per week; the green manure at 11*s.* per ton pays the best.

Although shoddy is now used for the lining of the tubs, street sweepings will be substituted in the summer. Nine horses and carts are used daily for collection, which is equal to sixty tons of fæcal matter, plus the packing which is fifteen pounds to the tub.

The horse, cart and man are estimated to cost 10*s.* per diem. If the borough were to take the collection into their own hands, and exercise a monopoly over all refuse, it would be done at a much cheaper rate, say 8*s.* 4*d.* Under these circumstances the ratepayers would be interested in seeing that no loss of time took place *in transitu*, and they would also feel an interest in the sale of the manure, which they might promote in many ways that are now denied to the company.

The district of collection is scattered in Halifax, and the company has to deal with very sparse suburbs. The system, however, which is not compulsory as yet, is largely adopted by owners of new houses, and in the event of any complaints arising from nuisances created by the old-fashioned ash-pits, cesspools, or middens, the Goux system is generally adopted.

The borough pays 12*s.* per closet, including the collection of ashes; last year only 7*s.* was paid.

Two and a half tons of the manure are sufficient for an acre of land, and competent persons believe that in rural districts, if the farmers would supply the packing in the form of stable litter (at Aldershot the litter is taken immediately out of the stables and used for packing), after the first outlay the system would not only be self-supporting, but remunerative.

In the event of this system being adopted by an urban or rural sanitary authority, and powers being possessed by those authorities to restrict the removal except by themselves, of that which ought to be scavenged, such as sewage, stable litter, soot, etc., the neighbouring agriculturists would no longer have to give exorbitant prices for artificial manures.

A few weeks since there was published by the medical officer of the Privy Council (John Simon, Esq., F.R.S.) a report on some recent inquiries made under the Public Health Act, 1858. Among those inquiries is one which has been laboriously conducted by Mr. Netten-Radcliffe with regard, as Mr. Simon says, to that branch of local sanitary administration which is most concerned with the prevention of enteric fever, viz., the disposal of sewage. To this report I alluded in my introductory lecture on public health, and the geography of disease at St. Thomas's Hospital, at the commencement of this summer session. It contains an account of particular modes of excrement disposal, viz.:—1. The midden system. 2. The pail system. 3. The water system. 4. The charcoal system.

During this investigation forty-nine places were visited, and the results are now before the public. It is a most valuable report, and particularly acceptable at this time.

For my own part, my experience tells me that for villages, if not for towns, some system which will admit of the excrement being regularly scavenged, and at the same time prevented from fermenting until it is removed to a suitable collecting place, is absolutely and imperatively called for.

In my own area, one extending over a thousand square miles, I have now advocated the carrying out of such a system because I know that, until something of the kind is done, no decided step really will have been taken in the true direction. I have to contend, and so have other medical officers of health, with deeply rooted prejudices in favour of that abominable cesspool system, which has been guilty of more secret poisoning than whole armies of Borgias could effect.

Mr. Netten-Radcliffe's report embraces the results of careful investigations, and will be of essential service to those who, like myself, are obliged to study the requirements of hundreds of villages, and I am glad to find that Mr. Radcliffe has formed a favourable opinion of the Goux system, of which he says: 'The sanitary advantages gained from the introduction of the pail system, such as the Goux, as compared with the midden system, cannot be over-estimated.' Two plates illustrate this report, showing how this system is applicable to old houses, in which, as the author says, 'the facility with which a pail closet, such as the Goux closet, may be adopted to the requirements of old houses is admirably shown.'

I have thought it right to draw public attention to a system of sewage disposal, which I feel convinced will help sanitary authorities out of many of their troubles. I feel convinced that the system is not only an economical one but one easily adapted to the towns and villages, and if carried out judiciously may be made not only self-supporting but remunerative. I should be glad to see it adopted throughout the whole of my area, for were it so I believe that typhoid fever would be starved out.

I address this letter to you at a time when between six and seven hundred members of Parliament, besides peers of the realm, are visiting their country houses, when I hope, as members of sanitary boards and in their private capacity, they will turn their attention to this all important matter, and investigate for themselves a system which I have advocated in this letter for the simple reasons I have given.

ALFRED HAVILAND,
Medical Officer of Health to the Combined Sanitary Authorities in the Counties of Northampton, Leicester, Rutland and Bucks.

August, 1875.

THE VENTILATION OF AN ORDINARY APARTMENT.

(*To the Editor of the* SANITARY RECORD.)

SIR,—Much has been recently written on this important subject. Numerous methods have been suggested which, in some cases, partially satisfy the necessary conditions of efficient ventilation.

These conditions may be stated to be—the changing the air of an apartment without causing a sensible draught and without lowering the temperature. To effect this a regular and constant inflow and outflow of air is necessary, not dependent on artificial methods which either incur expense or require such attention as to render their universal adoption impracticable.

All that we require is an application of the laws of gravitation and expansion.

The specific gravity of cold air outside an occupied room being greater than that on the inside, gives a tendency to the cold air to force its way into the room. To facilitate its entrance numerous small apertures should be provided by grates, either in the corridors or passages, or by the windows or doors.

Tobin's method of tubes is now used for this purpose. Plans for the inlet of cold air are numerous and not difficult; but a method for outlet does not so readily suggest itself.

As the temperature of a room rises, the expansion of the air increases, and becomes specifically lighter than the cold air; the effect of which is, the heated air forms an upward current, as we see in a column of smoke.

For the application of this law, the chimney flue is the best available outlet. The construction of a special flue

would be expensive. For ordinary rooms, to which we only refer, anything that adds much to the cost of building will seldom be adopted. After having made suitable inlets, to save expense for the construction of an additional flue, to support a regular and constant current of fresh air, we have successfully utilised the chimney flue by making use of Westmoreland's Ventilating Hearth, which, if not known to your readers, is worthy of description.

It is a combination of iron and concrete, containing within it two light, angle-shaped, sheet iron flues which communicate with the smoke-flues. When screwed to the trimming-joists, the top supports the hearth-stone or tiles; and on the underside is fixed a large brass grate four feet by six inches, through which the hot air passes from the ceiling into the chimney flues. We have fixed this ventilating hearth in an ordinary room, in a billiard-room, kitchen and smoke-rooms, with excellent results; in the smoke-rooms the unpleasant smell of dead tobacco-smoke is never felt.

We believe, combined with proper inlets for the admission of pure air, this hearth goes far to solve the great problem of 'ventilation in an ordinary apartment.'

Its ventilating properties are not all the important advantages which it possesses.

The bearing for the hearth-stone or tiles is a weak point in common buildings, and when supported by wood is sometimes the cause of fires.

The ventilating hearth is not only a protection against fire, but adds strength and durability to the structure.

As atmospheric changes are, occasionally, both sudden and violent, valves for the purpose of regulating the draught are attached to the grate.

A drawing, which might suggest an artistic treatment of the subject, is shown (page 112) in M. Viollet le Duc's work, 'How to Build a House.' D. B.

Carlisle, September 15, 1875.

UNWHOLESOME FOUNDATIONS.

(*To the Editor of the* SANITARY RECORD.)

SIR,—I shall be obliged if you will allow me to correct a curious error in my letter at p. 209. Instead of saying 'All that is necessary is to place the suspected soil in a basin of water,' I think I wrote 'All that is necessary is to place on the suspected soil a basin of water under a bell-glass, to keep the suspected air in contact with the water.'

The sentence as printed is hardly intelligible.

September 20, 1875. P. H. HOLLAND.

SIR,—In reference to Mr. Holland's letter in your last week's impression on unwholesome foundations, I should think that no one will deny that the soil and air combined possess wonderful powers of self-purification, and especially when in conjunction with vegetation. We are all aware of the aphorism that there is no spot on the earth on which a city has not stood or which has not been a grave. In making such allusions your correspondent is wide of the mark; the gist of the article he refers to, as I read it, tended to point out the evils of removing the natural subsoil from a building site, and then filling up the foundations with rubbish, street refuse, and decaying matters, which may be charged with septic poisons. Such foundations may, as our correspondent intimates, become self-purified in the course of time, though we ourselves have some doubts on the subject; as a closely impacted foundation is not conducive to the free circulation of the air, and that is an essential element. Then, again, the rebuilding of new houses on old foundations, the soil of which has been constantly receiving pollution for generations. Self-purification in this case is doubtless going on, but not in the ratio of defilement, as our correspondent can readily see if he walks down any London street when the roadway is 'up.' That such soil in the course of ages would, if left alone, become self-purified or fit for the foundations of healthy houses I have not the slightest doubt; but I maintain that to use it for such a purpose in its present state is an eminently dangerous practice. Cheap speculative, or 'jerry' builders, as they are termed, who run up their tenements on rotten foundations, are not likely to apply or to profit by Mr. Holland's excellent tests for soil impurities. M.P.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

ALLISON, John, L.F.P.S. Glasg., L.S.A. London, has been appointed Medical Officer of Health for the Bridlington Urban Sanitary District, vice Denton resigned.

BURNHAM, Mr. Henry, has been re-appointed Inspector of Nuisances for the Wantage Rural Sanitary District, vice the three relieving officers, whose appointments will expire 29th instant.

CATTELL, Mr. Robert Venning, has been re-appointed Inspector of Nuisances for the Linton Rural Sanitary District,

GAINE, Mr. William E. L., has been appointed Town Clerk and Clerk to the Urban Sanitary Authority, Blackburn, vice Beck, resigned.

HILDRED, Mr. J., has been appointed Surveyor to the Corporation, and to the Urban Sanitary Authority, Blackburn.

INGRAM, Mr. Henry, has been appointed Surveyor and Inspector of Nuisances to the St. Alban's Urban Sanitary Authority, vice Colbron, resigned.

KERRIDGE, Mr. Henry, has been appointed Inspector of Nuisances for the Samford Rural Sanitary District, vice Upton, whose appointment has expired.

LUCAS, Herbert, M.R.C.S. Eng., L.S.A. London, has been appointed Medical Officer of Health for the Godmanchester Urban Sanitary District, vice Syson, whose appointment has expired.

SAWYER, Robert Henry, M.R.C.S. Eng., has been appointed Medical Officer of Health for the Shaftesbury Rural Sanitary District.

VACANCIES.

ACCRINGTON URBAN SANITARY DISTRICT. Medical Officer of Health.

BRYNMAWR URBAN SANITARY DISTRICT, BRECKNOCKSHIRE. Clerk.

CLAY LANE URBAN SANITARY AUTHORITY. Clerk. Application, October 1, to Mr. Mycroft, Clerk *pro tem.*, Clay Cross.

FALMOUTH PORT SANITARY DISTRICT. Medical Officer of Health for six months.

HASLINGDEN URBAN SANITARY DISTRICT. Treasurer, Medical Officer of Health, Surveyor and Inspector of Nuisances.

HEXHAM URBAN SANITARY DISTRICT. Inspector of Nuisances: 100*l.* per annum. Application, 27th instant, to Isaac Baty, Clerk to the Authority.

NORTHAMPTON URBAN SANITARY DISTRICT. Inspector of Nuisances: 100*l.* per annum.

RAMSBOTTOM URBAN SANITARY AUTHORITY. Clerk and Surveyor.

WELLS URBAN AND PORT SANITARY DISTRICTS, NORFOLK. Medical Officer of Health. Inspector of Nuisances. Applications, October 2, to E. B. Loques, Clerk to the Authority.

SANITARY PATENTS.

1262. Water-closets and urinals. Henry Saxon Snell, Southampton Buildings, London.

1367. Gauging supply of water for flushing closets, etc. Benjamin Harries, Commercial Road, Landport.

1368. Purification of water, etc. Thomas Spencer, Euston Square, London.

1395. Washing-machines. Joseph Anthony Mason, Station Street, Burton-on-Trent.

1484. Manure. John Henry Johnson, Lincoln's Inn Fields, London.—A communication from Henri Olivier Prosper Lissagary.

2739. Ventilating buildings. James Livesey, Victoria Chambers, Westminster.

2753. Improvements in cinder sifters, which improvements are also applicable for sifting or separating other substances. John Macdonald Moody, Gosport, Hampshire.—A communication from John Sutton, Islip, New York, U.S.

2788. Improvements in coffins. Julian Larkman, Chelsea, London, and John Diprose, Kennington Park Road, Surrey.

2798. Improvements in the application of tidal currents to the discharging of sewage. Joseph Robinson, Littlehampton, Sussex.

2801. Improvements in ventilating water-closets, soil-pipes, and traps of same, also in flushing rims applicable to water-closet basins. John Dodd, Liverpool.

2802. Improvements in the construction of dry earth and water-closets. John Taylor, Bury, Lancashire.

2829. Improvements in the treatment or purification of the waste liquids discharged from paper-mills and other works, as well as the sewage of towns, and in the modes and means employed therefor. Thomas Stevens, May Villa, Churnside, Berwick, N.B.

2496. Deodorising. Millington Henry Synge, Pall Mall, London.

1754. Treatment of excreta. Joseph James Coleman, Glasgow.

1968. Steam engines. Alfred Hilton Legge and John Stevenson Richardson, Darlington.
2226. Ventilation, etc., of waterproof garments. John Richard Whitmore Luck, Walbrook, London.
2374. Grinding-wheels. John Cowdery Martin, Upper Hill Street, Richmond.
2406. Producing animal charcoal, etc. William Alexander Lyttle, Woodstock Lodge, the Grove, Hammersmith.
2832. Improvements in the construction of smoke and air flues. Augustus Frederick Livesay, Sandrock, Chale, Isle of Wight.
2850. Improvements in ventilating india-rubber garments, and in rendering same applicable for life-saving purposes, part of which is applicable for life-saving apparatus generally requiring to be inflated. Charles William Meiter, Gracechurch Street, London.
2853. Improvements in distributing manures, and in the machinery or apparatus employed therefor. Robert Parker, Stranraer, Wigton, N. B.
2887. Improved machinery for distributing over the snrface of land stable and farm-yard manure, and other composts. James Braby, Maybanks Ewhurst, Surrey.
944. Treating sewage. Dugald Campbell, Quality Court, Chancery Lane, London.
2554. Life preservers, air beds, etc. John Mackintosh, Bayswater, London, and William Boggett, Chelsea, London.
2576. Purification of coal gas. George Spencer, Cannon Street, London.
2560. Effecting the saving of fuel used for domestic purposes. William Green, Birmingham.
2667. Dealing with sewage. William Strang, Glasgo*w*, N. B.
1490. Funeral conveyance or carriage. Christopher Williamson, Leighton Buzzard, Bedfordshire.

ABSTRACTS OF SPECIFICATIONS.

268. Neutralising sewer or drain gas. D. Gill, Weston-super-Mare.

This invention consists of a vessel made of fire-clay or other suitable material for generating the desired gas or vapour for fumigation, with heating chamber under; an inlet pipe to admit air to drive fumes from the generating vessel forward into drain; an exit pipe from the said vessel for conveying fumes into drain; and a pipe or upshaft placed at the most suitable position to the drain, carried up to a suitable height: this shaft is to create a current to draw the fumes down into the drain and through it. This invention can be used to flush drains with fresh air without fumes. The principle of this invention is also applicable on a larger scale to public drainage, and may be extended over large areas by means of stations. The compound for chlorine gas has been found suitable, but other fumous disinfectants may be used by this method.

207. Preserving vegetable and animal substances. W. R. Lake, Southampton Buildings, London.—A communication from J. R. McClintock, New Orleans.

This invention relates, first, to the dry fumigation of the articles to be preserved by subjecting the same to the action of the gases or fumes generated from a compound of powdered sulphur and charcoal. After the process of dry fumigation has been completed the said article or articles must be submerged in water thoroughly impregnated with the gas or vapour generated from the same composition.

2621. Neutralising and deodorising noxious gases and sewage matters. D. Gill, Weston-super-Mare.

This invention consists in certain methods of neutralising the poisonous, noxious, and offensive qualities of sewer or drain gas, and also of neutralising the injurious qualities of sewage matters, and of deodorising the same; and in the construction and arrangement of apparatus for effecting such purposes, the whole forming a system of fumigation. For these purposes any chemical compound capable of readily evolving chlorine gas, or any other compounds belonging to the class of substances known as disinfectants is or are employed, the gases or vapours being produced therefrom, and brought into contact with the substances to be neutralised and deodorised by means of the apparatus, which is specially constructed and arranged to effect such objects.

165. Heating towns and villages. C. N. Cowper, Edinburgh.

The features of novelty which constitute the invention are the application of known methods of heating by means of steam and hot-water piping to the larger area of towns or villages, and the houses and premises therein, the heat being supplied from one common source. This system or process will secure the following novel economical results and advantages. (1) Great economy of fuel and utilisation of heat; (2) the continuous equalisation of the temperature of rooms; and (3) it can be utilised where the system is in force for rapidly clearing the streets of snow.

317. Hot water apparatus and boilers. H. Ormson, Stanley Bridge, Chelsea.

This invention mainly relates to a divisional or a single, double, treble, and quadruple system of heating by hot water apparatus, effected by arranging the stacks or ranges of hot water pipes in connection with duct or chamber, having valves so disposed that some or all of them may be turned on or off, and thus leave in operation or shut-off some or all of the pipes. A boiler is preferred to be used of a dome shape, and so constructed that stoke-holes and deep-setting are dispensed with. The feed to the boiler and water circulation is effected by an arrangement of circulating box and pipes, which communicates with the heating pipes, and the return water from which passes into the boiler by return pipe by leg or dip part of boiler. Various accessory details are described.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer—not necessarily for publication.

BUTTER AS A RE-AGENT.

BUTTER is said to be a very sensitive re-agent to reveal the presence of copper.

THE PRESERVATION OF TIMBER.

THE following method is used in Germany for the preservation of wood. Mix forty parts chalk, fifty resin, four linseed oil, melting them together in an iron pot; then add one part of native oxide of copper and afterwards one part of sulphuric acid. Apply with a brush. When dry this varnish is as hard as stone.

FISH FLOUR.

A REMARKABLE article, says the *Miller*—namely, fish flour—has been brought forward in the last few years. It is not as yet, we hear, manufactured in any great quantity, as the article is still new in the market, and consequently there is no great demand for it. The flour is prepared from dried fish of the first quality; it is thoroughly desiccated, and then ground in a mill.

SOLUBILITY OF GLASS.

GLASS vessels in which various liquids, and even pure water, are boiled, give up by degrees a small quantity of their substance—silica, potash, soda, and lime. The analysis is the more misleading the longer the boiling is continued. This, at least, was what resulted from German glasses sold at Nancy in 1874. The fact may be shown by boiling in a flask pure water, mixed with a tincture of red cabbage, or syrup of violets slightly reddened by an acid. After a few minutes the liquid turns green. French glasses, with a base of soda, are not sensibly attacked, and therefore do not suffer this inconvenience.—*Pharmacal Gazette.*

THE LONGEVITY OF PAUPERS.

THE *Aberdeen Free Press*, quoting from the printed list of registered paupers in the out-door roll of Old Machar parish at the present time, shows that no fewer than 156 paupers have reached the age of seventy and above. The following are the details:—1 at 95 years, 95; 2 at 93, 186; 3 at 91, 273; 1 at 90, 90; 2 at 89, 178; 3 at 88, 264; 3 at 87, 261; 2 at 86, 172; 6 at 85, 510; 5 at 84, 420; 4 at 83, 332; 4 at 82, 328; 5 at 81, 405; 6 at 80, 480; 8 at 79, 632; 4 at 78, 312; 15 at 77, 1,155; 9 at 76, 684; 14 at 75, 1,050; 12 at 74, 888; 11 at 73, 803; 11 at 72, 792; 15 at 71, 1,065; 10 at 70, 700. Total paupers, 156; total years, 12,075—average age about 77⅜ years. Lunatic paupers are not included in the foregoing.

ANCIENT WATER-WORKS.

SEVERAL civil engineers, engaged with the surveys for a water conduit from Touja to Bougie, have made a very interesting and important discovery. A mountain which was situated in the proposed line of the conduit was to be tunnelled for a length of 500 yards; and in searching for the most suitable place the engineer discovered an ancient tunnel, 6 ft. 8 in. in height, and 19 ft. 7 in. in circumference. It is supposed that this is the same tunnel mentioned in an epigraph found at Lambéoc, according to which the tunnel was built in the reign of Antoninus Pius, the plans being prepared by a veteran of the Third Legion, named Nonius Datus. Finding works like this after a term of 2,000 years, we cannot but be greatly astonished at the power, energy, and genius of a nation which produced, with the limited means available at those times, such gigantic structures.

PUBLICATION RECEIVED.

Sanitary Science as applied to the Healthy Construction of Houses. By R. Scott Burn. Glasgow: Messrs. Collins, Son & Co.

Communications have been received from:

Mr. Daniel Birkett, Carlisle; Dr. Pullin, Sidmouth; the Secretary of the Lavatories Company, London; Mr. P. H. Holland, London; Mr. J. A. Davenport, Nantwich; Dr. Fergus, Glasgow; Dr. Ferguson, Bolton; Mr. G. F. Chambers, Eastbourne; Mr. Thomas Wright, Cheltenham; Mr. Joseph Newton, C.E., Balham; Mr. Francis George Heath, London; Mr. Bailey Denton, C.E., London.

EARTH TO EARTH.—The superiority of the London Necropolis (Woking Cemetery) has been specially recognised in the *Times*, and other leading journals, and it is admitted that here only can the burial of the dead be properly carried out. The Company is prepared to conduct Funerals without the intervention of the ordinary undertaker at any stage of the proceedings. Prospectus free.—Office, 2 Lancaster Place, Strand, W.C.

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Original Papers.

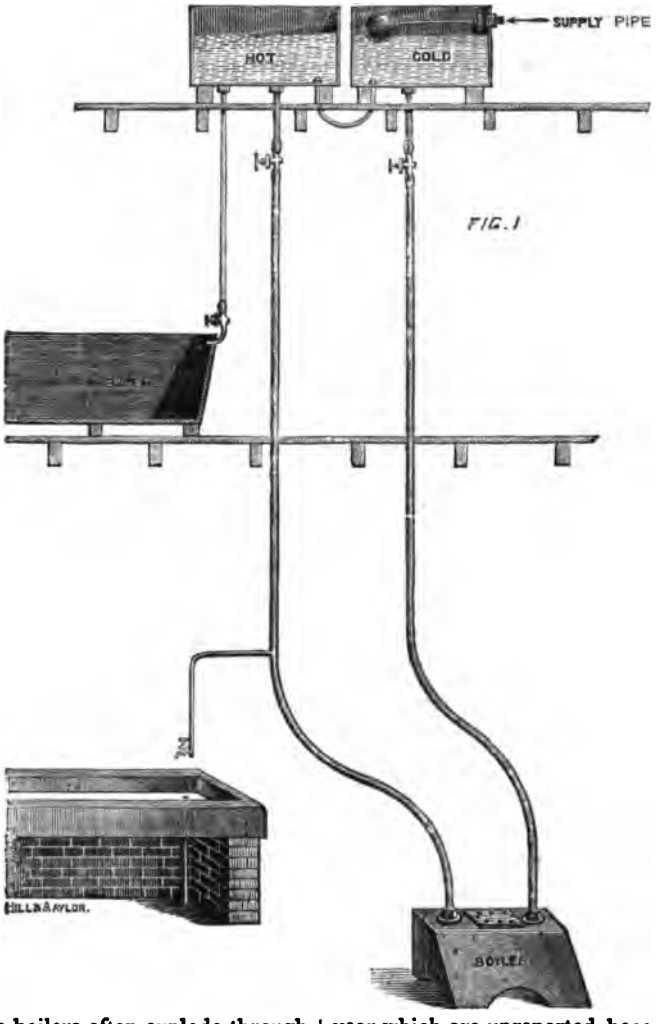
KITCHEN BOILER EXPLOSIONS.*

BY ALDERMAN J. BAILEY, SALFORD.

EVERY winter in this country there are many fatal accidents caused by the explosion of what are known as circulating or bath boilers; there is also a great amount of damage done to house property, and some domestic misery created by the bursting of water pipes, caused by the water freezing in them.

I have paid a little attention to these two subjects, which are somewhat of a kindred nature, and when I was honoured by a request from your society to read a short paper on them, I gladly acceded to it, knowing the wide-spread influence of your members, and feeling that some good would be done to society if I could only lay before you certain facts as they appear to me. I feel very diffident of my ability to do this, and hope you will bear with me if I appear tedious in describing things which may be familiar to many of you, but without doing which I might render myself obscure to those unacquainted with them.

There seems to be among many people an impression that domestic boilers often explode through a deficient water-supply. I believe that is not the case, and I think it will be very difficult indeed to demonstrate that any accidents have occurred through this cause.† A great number of boilers burst every year which are unreported, because not attended with fatal results. Of those which have been reported



* 'The Prevention of Kitchen or Bath-Boiler Explosions, and the Bursting of Water-Supply Pipes in Winter.' A paper read by Mr. Councillor W. H. Bailey, Salford, before the Society of Borough Engineers, at their annual meeting at the Town Hall, Manchester, July 2, 1875.

† I think this popular delusion must have been created by people who are unable to see the difference between a hot water circulating boiler, which should always be full of water, and a steam boiler, which only has sufficient water in it to generate the steam required. Accidents from low water often occur in steam boilers, and as very often cold water is suddenly ejected the moment the danger is discovered, the cold water bears the blame and is said to have caused the accident, without much regard to strict accuracy of language. Attempts have been made to burst both boilers by making them red hot and then suddenly introducing cold water, and it was found that out of about twenty experiments only one boiler has cracked slightly, this crack evidently resulting from sudden contraction of the part and not from over-pressure. When water was introduced it was suddenly ejected through the

during the past six or seven years, half appear to have exploded through stoppage of the circulating pipes by ice, and the remaining half have been caused by the fixing of stop taps in those pipes.

A few years ago circulating boilers were only in existence in comparatively few large houses and hotels, but now nearly all new houses of the value of 20*l.* per annum or more built in this country have bath boilers, and, unfortunately, the great majority are of cast iron, of the very worst form for resisting pressure. There are two slightly different modes of fixing these in this district, which I will endeavour to describe.

The ordinary and cheap way of fixing and supplying kitchen boilers is illustrated by Fig. 1. The supply of cold water is received in a cistern at the top of the house, and conducted by the 'down pipe' into the boiler; having passed through this, and having become hot, and therefore of less specific gravity, it ascends what is called the 'up pipe' to the hot-water cistern, from which it is drawn as required for use. An equilibrium of temperature is produced by the pipe connecting the two cisterns in a manner which I need not now describe.

It will be seen that the pressure the boiler has to sustain when filled with water depends upon the height of the supply cistern above it; two feet three inches of water in column being equal to a pressure of one pound on the square inch; therefore sixty feet high will give a pressure of seventeen pounds per square inch on the boiler. As, however, most boilers are only about thirty feet or forty feet below the cistern, we may consider that the average pressure at which they work will be about ten pounds on the square inch.

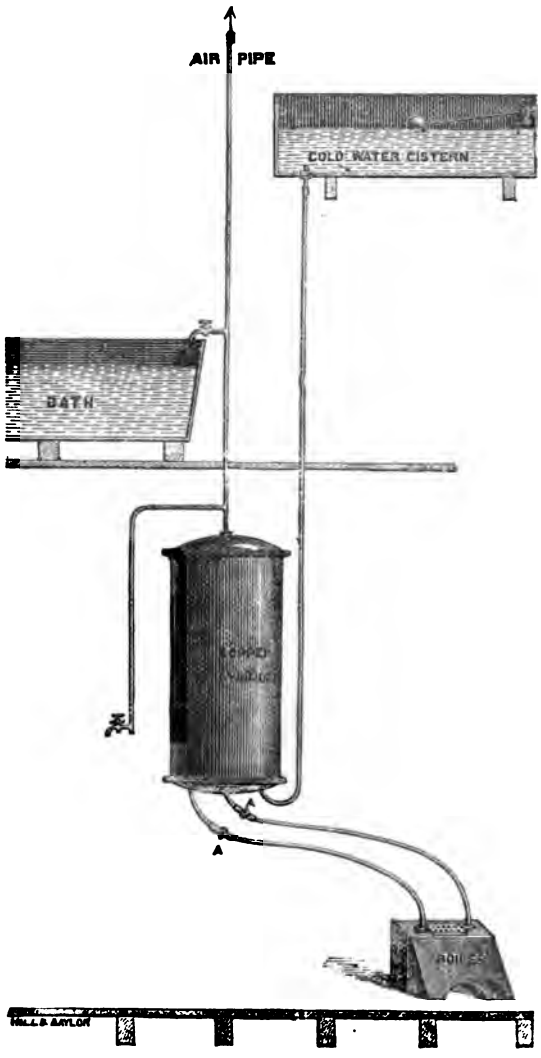
In good houses in this district copper cylinders are fixed in connection with the boiler, in order to give an abundant supply of hot water, and for preventing and rendering explosions impossible; that is, if we are to believe what is told us by more than one respectable tradesman. So much has been said about copper cylinders preventing explosions by men whose business it is to know better, that I will refer to it a little later on.

Fig. 2 represents the arrangement when the hot-water cylinder is used. It differs slightly from the plan I have already described, the hot-water cistern being dispensed with, and a large cylinder, generally of copper, being used instead. A pipe is taken from the top of this cylinder, called the air-pipe, which is open to the atmosphere, and in which water ascends to the level of the cold water supply cistern. The great advantage in using these cylinders is obvious, as the constant circulation which is always taking place causes the water when cool to descend into the boiler, and, when hot, up again into the cylinder, absorbing all the heat possible for the boiler to give it, which is not the case in the simpler and less expensive mode of fixing.

Sometimes the hot water is drawn from the top of the cylinder, and sometimes from the air pipe. In both these systems of fixing it will be seen that the boilers are always full of water, and that, supposing the supply of water to cease, it would not be possible to drain them dry, causing the fire to make them red-hot, and thus create damage by cracking the boiler. The source of danger and death is to be found in the direction to which I have alluded; and if there is one thing at all that creates astonishment in my mind, it is the fact that I stand here in this city of Manchester and state that it is unsafe to work a boiler under pressure which has not a safety-valve fitted to it.

With the best intentions many boilers have taps

FIG. 2.



fitted in the up and down pipes, as shown on the drawing Fig. 1, so that if any accident occurs to the boiler it may be repaired or removed without fear of inundation. These taps have caused many fatal accidents in summer as well as in winter. If these taps are by any means closed when the boiler is at work, the water is sealed in the boiler, and nothing can prevent pressure accumulating unless the fire be put out. Only a few days ago I talked the matter over with an architect of no mean reputation in this district, who informed me

circulating pipe without further damage than what I have named. These experiments were conducted under the supervision of Mr. E. L. Fletcher, chief engineer of the Manchester Steam Users' Association; and, I am told, that so confident did the experimenters become, that they stood round the boiler during the trials. Recent writers, who ought to know better, have alluded to this imaginary cause of explosions, and that must be my excuse for this foot-note.—W. H. B.

that he would not think of permitting a good house to be fitted with a boiler which had not these taps fixed. He had ordered several houses to be fitted with taps under the copper cylinders, as represented on Fig. 2. I am glad to say he altered his opinion when I explained to him the facility which he thus gave to ignorant or careless people for creating a magazine of destruction. A destructive explosion was created in the house of Mr. Pease, of Darlington, by their means some short time since; and on October 9 last, at a newly erected West End club in London, a serious explosion was caused by them. To quote Mr. Lavington E. Fletcher, chief engineer of the Manchester Steam Users' Association, who has kindly rendered me valuable assistance in giving me some facts in connection with these subjects, the boiler was of the ordinary circulating class, connected to a cistern by two circulating pipes. Between the boiler and overhead cistern were two stop-taps; the hand-hole in the boiler had been leaking, and a mechanic having been sent for to make matters right, on examining the boiler he shut off the taps. He then left the job, taking the precaution, however, to write over the fire-place—'This fire must not be lighted.' Unfortunately, this warning was neglected. The fire was

FIG. 3

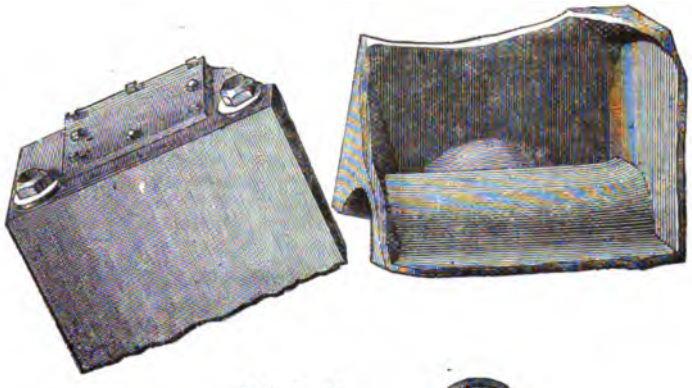
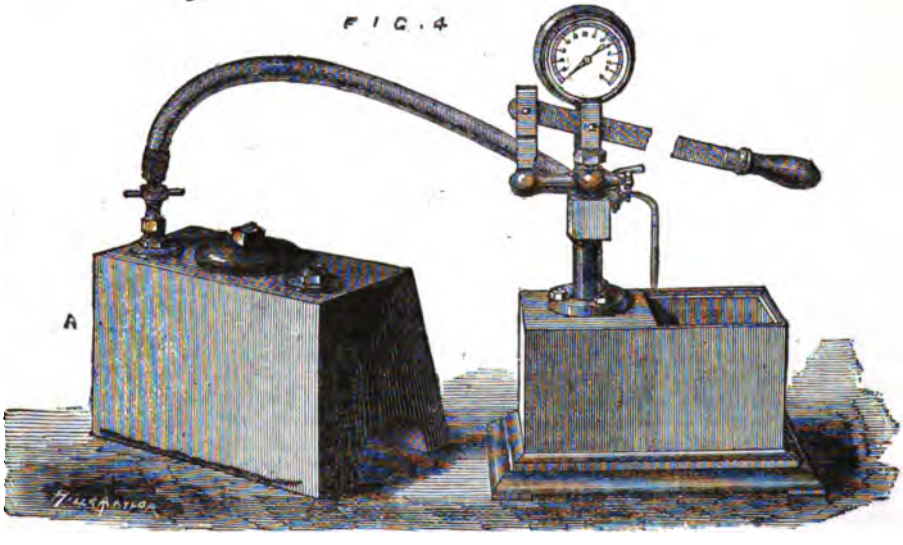


FIG. 4

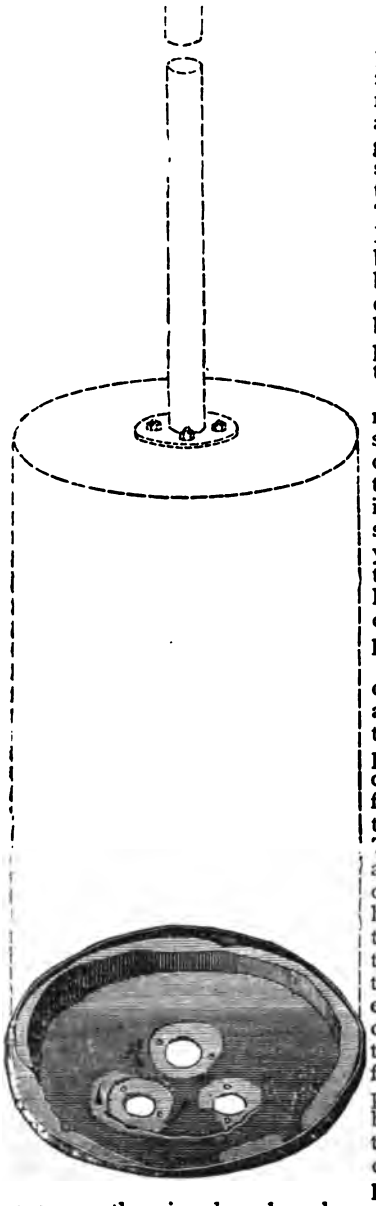


lighted at ten o'clock on the following morning; and, as the outlets were both closed, the boiler burst about two hours afterwards, when the front was blown out, and the whole range shot forward into the kitchen. Fortunately, only one man was slightly injured, there being no one else in the kitchen at the time.

The fixing of these stop taps caused the death of a young woman in January of this year; this is known as the Eccles New Road accident. As it occurred in my own neighbourhood, and in Seedley Ward, which I have the honour to represent in the town council of Salford, I took more than an ordinary interest in it. I was the foreman of the jury convened to inquire into the cause of death. It appeared that the proprietor of the house, actuated by a proper desire to make his house safe from inundation, in case of accident to pipes or boiler, consulted a plumber, who informed him that the best way was to fix two taps, one in the up pipe and one in the down pipe of the bath boiler. These were placed in the bath-room immediately under the cisterns, the boiler not having a copper cylinder; they were fixed where any mischievous lad could have turned them at any time. A leakage during the thaw of entirely different pipes caused the proprietor to turn these taps off and having done this he ordered the fire out. A plumber was sent for and told to make all right; the leaking pipe was soldered, he reported all correct, but omitted to turn the taps on again. The result was that an explosion took place, which removed the ranges of the house and the one next door, making a

breach in the division wall sufficiently large enough for anyone to walk through. The window was blown out, and the poor woman was blown half-way through it. No one was in the kitchen of the other house, or the consequences might have been more serious. The boiler, Fig. 3, measures twelve and a-half inches long, ten inches broad, and is ten and a-half inches high. The top and front were blown out in one piece; the area of this gives 240 inches, which if multiplied with the 250 lbs. pressure required to burst a similar boiler, gives a total pressure of more than 26 tons. The new boiler, Fig. 4, has been burst by me, by means of hydraulic pressure by the little test pump attached to it.

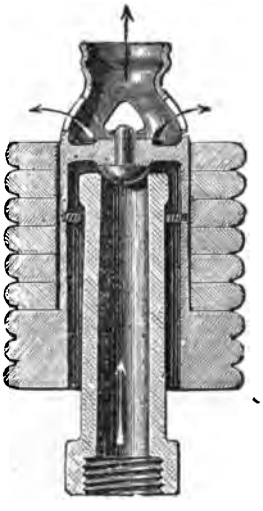
FIG. 5.



I could give more details of similar accidents caused by these taps, but I think it scarcely requisite to occupy your time with them, having, I hope, proved how dangerous the practice is.

I will now proceed to those accidents caused through the stoppage of the circulation by the freezing of the water in the pipes. These accidents appear to occur chiefly when houses are entered upon by the tenants in the winter time, everything being cold, the water in the pipes being frozen. A fire is put under the boiler by the new tenant, and an explosion takes place. In very severe weather pipes have been known to accumulate ice in one night, those boilers fixed without copper cylinders being most dangerous. Not far from the scene of the Eccles New Road accident, about two years ago, a Mrs. Cowie was killed by an explosion from this cause. The water in the boiler had longer time than usual to cool on the Saturday night, and Mrs. Cowie having got up late on the Sunday morning, after the fire had been lighted a short time, the boiler burst, and she was blown across the kitchen and down the cellar steps and killed. Another accident from a similar cause occurred near Brunswick Street, Manchester, in January this year, which nearly killed a young woman, and I believe now she lies on a sick bed through the effects. At the same date the copper cylinder bottom which is on the table was blown out in a house in Bolton Road, Pendleton; there was no one in the kitchen at the time, or they might have been scalded to death. There was another accident to a copper cylinder at Gilda Brook, near Eccles; and in the same week the boiler that was fixed to replace the one that killed Mrs. Cowie burst with an accumulation of ice, the house being empty. One occurred at Glasgow on December 25, which seriously injured a man; one at Burnley; one at Chorley, which killed a little girl, on December 23. In this case the tenants had only just entered, and a fire having been put under the boiler, it burst, with the sad result I have named. On December 28 an explosion of a circulating boiler took place at Fulwood workhouse, near Preston, which killed one man and injured two others. December 30, one at Bradford, one at Delph December 8, one at Ashton-on-Mersey on December 7, one at Bolton on the same day, and one at Hyde about the same time. There are a great many of these accidents unreported, because unattended with death. I have found that in the neighbourhood of Seedley, where the woman was killed in January, that no less than five bursts took place about the same time.

FIG. 6.



Having endeavoured to show the two chief causes of these explosions, the natural question is, What is the remedy? What will prevent this destruction of life and property? I have no hesitation in saying that if safety-valves had been fixed that every one of the accidents would have been prevented. And as the ordinary lever safety-valve would possibly become inoperative in course of time, a little pendulous safety-valve, of the Cowburn type, Fig. 6, has been recommended as not likely to get out of order by Mr. Fletcher, of the Steam Users' Association; and if safety-valves were fixed on the boiler,* I think there is no objection to the use of taps

* A writer on this subject since the paper was written objects to this valve and states that it cannot be fixed on the boiler where I suggest. He also states that soot would accumulate round the valve and render it inoperative. Anxiety to be brief may have rendered me obscure. I know of a great number of these valves which are at work: they are fixed in such a manner as to leave a little chamber in the brickwork for them; this has a small cast-iron door and frame similar to those used for stoves; this enables the valve to be examined at any time, and keeps soot and dirt away. The valve may be fixed on one side of the boiler, or even on one of the pipes by using an elbow, but this is not to be recommended if the water has in it sulphate or carbonate of lime, which often

in the circulating pipes, as they are undoubtedly useful in case of accident. Weak plates of white metal, Fig. 7 D, have been recommended instead of safety-valves, which would burst at a low pressure. I have made extensive experiments on these plates, and have burst a great number by actual steam-pressure; but I found that I never could get two alike out of the same mixture of metal. There are also many other objections to them which I will not occupy your time with.

A word about copper cylinders preventing explosions. Circulars have been issued by ironmongers in which it is distinctly stated that these things render an explosion impossible. This delusion, which has such a firm hold in the minds of many people, demands some attention. A copper cylinder fixed to a boiler makes it safer from those explosions which are caused by ice in the pipes. It is just possible that the death of Mrs. Cowie, which was caused by the water freezing in one night, would have been prevented by one, as the hot water in the cylinder makes it a storage of heat, which resists the attacks of cold for a longer time than a small pipe full will do. A copper cylinder only delays the danger a few hours at most in severe winters, and its utility ends at that for preventing explosions. The bottom of the cylinder on the table was blown out through one night's frost; and anyone having a cylinder who wishes to have a hot both late at night when the servants have gone to bed, can empty all the hot

FIG. 7.

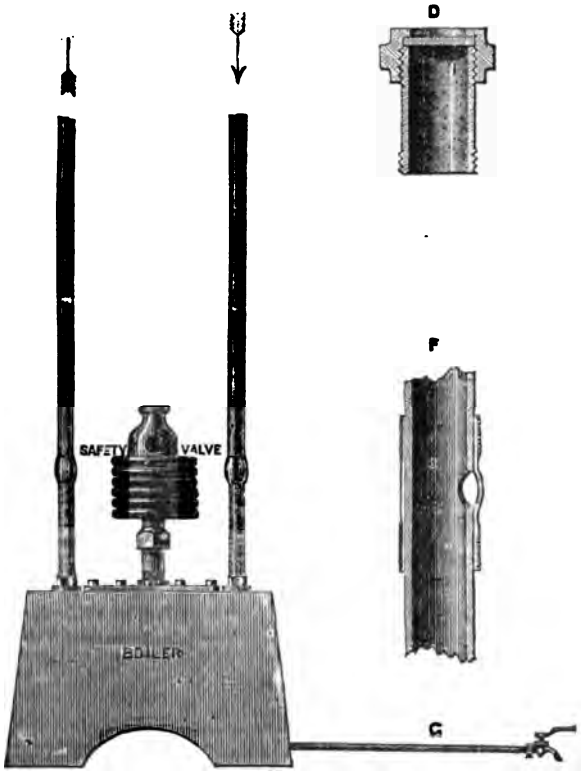
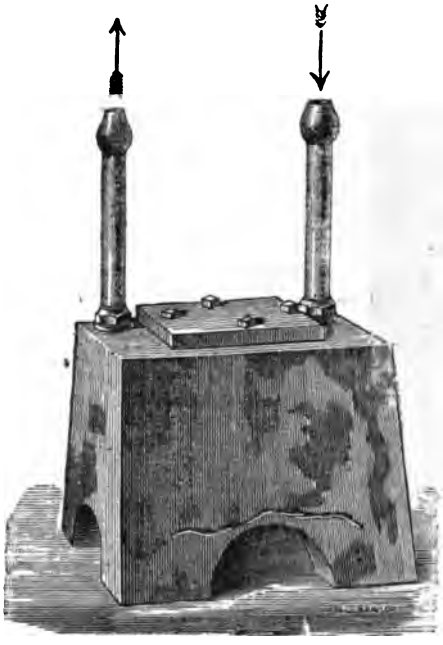


FIG. 8.



water out, which will be replaced with cold, and by this simple means reduce the power of its resistance to the effects of cold. A cotton broker of Liverpool bought a small house at Southport, and went into it in the winter time. He was a widower, and required only one servant. He hired one at Southport. After putting her in his new house, he went to his business in Liverpool. On his return he found part of the boiler in his little back garden, and part of the gable end of the house blown out. He informed me that the girl was not injured, being in another part of the house at the time. A copper cylinder would not have prevented this accident; a safety valve, at a cost of 8*s*. or 10*s*. would have done.

I think that owners of house property would do well to have stop taps fixed in the bottoms of bath boilers, to enable the water to run out when the houses are not tenanted. I have been informed of several that have been cracked by the accumulation of ice inside the boiler this last winter in empty houses. The one marked Fig. 8 is one taken out of a house in West High Street, Pendleton; three others were cracked in the same street. When tenants leave in the winter time, it is, therefore, desirable to empty the water out to prevent this loss. There is also the element of safety in this when the incoming tenant is considered.

cause deposits sufficiently great to stop up horizontal pipes, which would, of course, prevent the valve from working. I am not an advocate of finality or of any special valve. Let those who fix these things use good valves, and if they can get a simpler and less expensive one than this, it should be used; but under all conditions, I wish to reiterate, a safety valve must be used.—W. H. B.

Gentlemen, I hope I have made the subject as plain and as simple as it really is; I hope I have shown to you that this destruction of human life and property is not surrounded or obscured by things which are difficult to understand; that it does not require profound scientific skill to prevent it; that we have it in our power to stop a great amount of mischief without evoking the aid of anything but the most ordinary means.

FIG. 9.

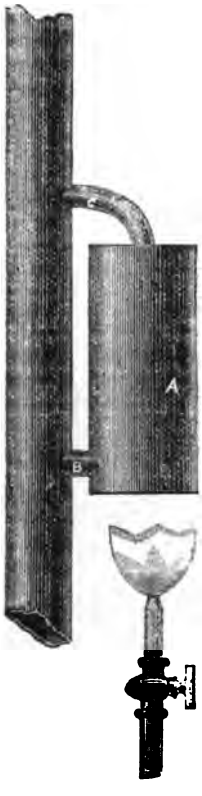
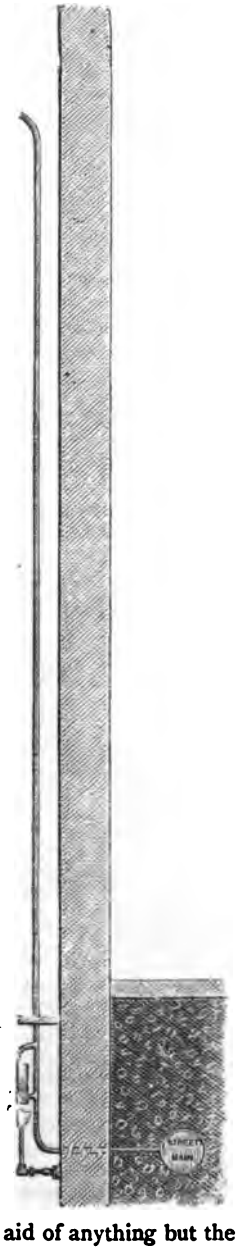


FIG. 10.



I am not here as the advocate of any new system of patented mysterious pipes, but simply to say that a safety-valve in every case mentioned would have prevented accidents. If this be true, what is the duty of the municipal authorities? It seems to me to be very clear and straight before them.

Action of some sort is imperatively needed, either by the imperial or municipal authorities, in order that these things may be fixed in a safe and proper manner.

Closely allied to the subject we have been considering is the bursting of water-supply pipes in frosty weather through the expansion of ice.

My paper has already exceeded the time allotted, and I will shortly endeavour to describe a little plan which is not patented, and which I think may be used with some benefit. The social misery, without mentioning the damage to property, which takes place every winter from this cause, is great, and needs no comment. Various remedies have been suggested, but I have not been able to find that any have been successful. Elastic diaphragms, Fig. 7, F, rubber balls, and many ways of creating more space in the pipes to allow the ice to expand, have been suggested, but without effect. Strong pipes will burst when water becomes ice. Hydraulic cylinders that will bear a pressure of five tons on the square inch have been cracked in Manchester warehouses by the water freezing in them. If this be so, it will be apparent that stronger pipes than those at present used will not prevent the evil; therefore, if we cannot get pipes of a material that will bear the pressure of ice, the next best thing is to prevent the ice accumulating.

This may, in some cases, be done by covering the pipes with felt, and fixing them on inside walls. As, however, most water-supply pipes are fixed on the inside of outer walls, and, therefore, very easy to become frozen up, it has occurred to me that if a little cylinder and gas-jet be used, as illustrated, Fig. 9, it might keep the water warmer than freezing-point, at a very small expenditure for gas. The cylinder may be about six inches long and three inches diameter, and might be fixed in the cellar, Fig. 10, at a point where the water enters the house, being connected by a small tube at each end to the water-supply pipe of the house. Under this cylinder, during frosty weather, a very small jet of gas might be constantly kept burning, which would cause the water to ascend, and thus promote a slow circulation. If, however, a separate pipe, quarter of an inch bore, were to be connected to the top of the cylinder, and then taken and connected to the highest and coldest part of the water-main, it would be made more effective, as the circulation of warm water would be then complete.

MODERN RESEARCHES ON ALCOHOL.

BY BATHURST WOODMAN, M.D.

I.

Introductory.

Now that chemists give the name of *alcohols* to a great variety of carbon compounds, it is perhaps as well to state once for all that the word alcohol in these papers is taken in its common meaning, as the product obtained in the vinous fermentation of sugar, and known to chemists as ethyl-alcohol (C_2H_6O). In more or less quantity this forms an essential ingredient of almost all the stimulating beverages now employed by mankind, and of most of the beverages of antiquity. Whatever philologists or moralists may say to the contrary, those readers of Holy Writ and students of the classics who regard the sense rather than the words, cannot doubt

that many, at least, of the drinks used by the ancients, were of similar character to the wines and malt liquors of the present day. This is not the place for a long list of quotations, but one or two from old Greek authors will suffice to convince most candid readers.

Thus Hesiod (some 800 or 900 B.C., for many consider him contemporary with Homer) says:

Ὅστις ἄδινον πίνει, οἶνος δέ οἱ ἔπλετο μάργος.
He who deeply drinks,
But little reason thinks.

And Theognis (B.C. 549) remarks:

Ὃς δ' ἂν ὑπερβάλλῃ πόσιος μέτρον, οὐκ ἔτι κεῖνος.
Τῆς αὐτοῦ γλώσσης καρτερὸς οὐδὲ νοοῦ.
Who drinks too deep the flowing bowls,
No longer tongue nor thought controls.

Panyasis, again (uncle to Herodotus, B.C. 500), sings:

Οἶνος μὲν θνητοῖσι θεῶν πάρα δῶρον ἄριστον,
Πινόμενος κατὰ μέτρον, ὑπὲρ μέτρον δὲ χέρειον.
Drunk till the drinkers are drunken—a perilous gift is wine;
Drunk as it should be drunken, 'tis the noblest gift divine.

And again, Eratosthenes (B.C. 200):

Οἶνός τοι πυρὶ ἶσον ἔχει μένος.
Fire and wine alike are equally full of force.

Whilst Eubulus prescribes only three cups of wine to the wise, for, says he, the fourth is wanton, the fifth clamorous, the sixth furious and pugnacious (Τρεῖς γὰρ μόνους κρατῆρας, etc.) Hippocrates (Aph. 56, bk. vii.) says that 'a mixture of wine and water cures fright, yawning, and shivering' (Ἀλύκη, χάσμη, φρίκη, οἶνος ἴσος ἴσῳ πινόμενος λύει τὸν νοῦσον). Many other passages might be quoted from other writers and from Hippocrates to the same effect, but these will suffice.

The exact period of the discovery of distilled spirits (usually attributed to the Arabians about the twelfth century) is unknown, though probably of great antiquity. The quantity of alcohol contained in various beverages is very variable, ranging from 2 or 3, to 10 per cent. in malt liquors and light wines, to 17 or 25 per cent. in heavier wines, and nearly 50 per cent. in spirits. It may perhaps startle many total-abstainers to learn that one of their favourite beverages, *ginger-beer*, is really a fermented liquor, and contains alcohol in proportions varying from 2 to 4 or 5 per cent. Nevertheless the fact remains. I should be very sorry to diminish the sale of ginger-beer, which I regard as one of the best of our summer beverages, containing as it does, in almost all samples, either free citric or tartaric acid, or the almost equally beneficial bitartrate of potash. I have before me the receipts of several large makers, and take the first that comes to hand. It contains, besides ginger, tartaric and citric acids, 200 lbs. of sugar to 180 gallons of water. These ingredients are duly fermented, etc., and then bottled. Now, 200 lbs. of sugar (*cane* sugar) will produce in fermentation nearly 100 pints of alcohol; and, making all allowances for loss in yeast, by evaporation, in bottling, etc., it is quite plain that this liquor will contain about 4 per cent. of alcohol, and the result of actual experiment shows the same. The other receipts only differ slightly in the amount of the saccharine substance, as regards the water, or the kind of sugar present, or the acid employed. This percentage of alcohol is, of course, about half the strength of most of the malt liquors in common use by the middle classes of this country, but about equal to many of the cheaper ales, and to much of the beer drunk in Germany and other parts of the Continent. As an introduction to the practical part of these papers, it may not be uninteresting to append the relative strengths, as regards alcohol of some of the most common beverages. For many of these I am indebted to Sonnenschein's *Handbuch der Gerichtlichen Chemie*, though some are taken from Dr. Dupré, and some from other sources.

Winter 'Jung' beer from Munich contained 3·9 per cent. alcohol (A.D. 1849); Augsburg do. (1854) 4 per cent.; Bayreuth (1854) 2.3 per cent.; Landshut (1854) 3·4 per cent. Whilst summer 'Lager' beer from Munich in 1846 had 4·4 per cent., ten months old 'Doppelbier' from Zacherl (1853) contained 5·2 per cent. So did 'Franziskaner Kloster' of the same year. Sedelmayer ale (1850) contained 7·8 per cent.; Barclay and Perkin's porter (1852) 5·4 per cent.; W. Younger's Scotch ale (1851), two years old, had 8·5 per cent.; Bock-bier 4 per cent.; Munich ale 6 per cent.; Bavarian Lager-bier 8·3 per cent.; and Ballenstadt beer 9·5 per cent. Lacamber's analyses give 7 to 8 per cent. for London ale, 5 to 6 per cent. for porter; while the common kinds contained, according to him, 4 to 5 per cent. for ales, and 3 to 4 for porter. Dr. Christison's analyses give 6·1 per cent. for two year old Scotch ale (bottled), 5·4 per cent. for porter (four months old), and 6·3 for stout in good condition. Some very strong bottled ales and stout have been said to contain from 10 to 12 per cent.; but this is quite exceptional. As regards wines, cheap claret of the so-called 'Gladstone' variety, is found to contain 8·5 to 9 per cent. of alcohol, and the higher priced clarets do not materially differ, some containing even less, and others from 9 to 13 per cent.; good Burgundies from 7·7 to 11 or 12 per cent.; German hocks from 9 to 11 per cent.; Hungarian red and white wines about 10 or 11 per cent. As regards other analyses, to save constant repetition, it seems best to tabulate the percentage of alcohol:

Sherry (1860), high price	17.8 per cent.
Ditto (1857) ,,	18·4 ,,
Ditto (mean of 13 varieties)	18 ,,
Strong sherry (Christison)	20 ,,
Madeira	21 ,,
Ditto (old wine)	16 ,,
Lacrymæ Christi	17 ,,
Strong Madeira	22 ,,
Mild port wine	18 ,,
Mean of 7 kinds	20 ,,
High price port	15 ,,
Strong port wine	23 to 27 ,,
Sparkling champagne	10 to 11·6 ,,
Orange wine (average of 6 samples)	11·26 ,,
Gooseberry ditto	11·84 ,,
Cider (highest average)	9·87 ,,
Ditto (lowest average)	5·21 ,,
Perry (mean of 4 samples)	7·26 ,,
Mead (Brande's analysis)	7·32 ,,

Tables of this sort might be extended over many pages; but no practical object would be served, as readers who care for such details will easily find them in special works on the subject of wines, such as that of Drs. Thudichum and Dupré, or in treatises on food and works on practical chemistry such as Sheridan Muspratt's. Sufficient have been quoted to show the great variety in strength of such beverages. Nor is there much uniformity in the strength of different spirits and liqueurs. As nearly all these beverages contain a variety of other ingredients, under the name of 'extractive,' with sugar, tartaric, sulphuric, and other acids, various ethers, oils, and bitter principles, and in the case of many samples of spirits more or less fusel oil and other matters [which

are got rid of by repeated distillations, by keeping, and other methods, in the case of good and high-priced spirits] it cannot be wonderful, and is indeed a well-known fact, that their effects, either for good or for evil, are by no means uniform. Of late years, therefore, experimenters have generally made use of dilute alcohol of known strength in their experiments; or of wines and spirits, whose composition and strength were previously ascertained. It will be very evident, as we trace their labours, as far as possible historically, that very much has yet to be learnt. Yet some things stand pretty clearly out of the chaos of contradictions; and the object of my paper will be to show, as far as possible, the present standpoint of what is commonly called the 'alcohol question.' It is clear that this has, even practically considered, a twofold aspect—which we may call the physiological, or the effects of alcohol in health; and the pathological, or the effects of alcohol in disease. Some of those who join in this discussion, would add to these the toxicological, because they regard alcohol in all forms and of all strengths as simply poison. This, however, is to prejudge the very question we are discussing, and, in point of fact, should this really be so, it would appropriately fall under the heading of the physiological effects, or the results of the ingestion of alcohol in health; for we imagine there are none who claim to be called scientific who would deny the temporary benefit gained by using alcohol in cases of syncope from hæmorrhage and other causes. The chief controversy in our own day is on the question as to what becomes of the alcohol taken into the body. Is it changed in its form, and more or less assimilated or digested, or is it eliminated as alcohol wholly, or nearly entirely? No one, we believe, is hardy enough to deny that some portion is so eliminated, at least when sufficient is taken. This question became one of great scientific interest from the date of the publication of MM. Lallemand Perrin and Duroy's work, *Du Rôle de l'Alcool et des Anesthétiques dans l'Organisme*,' Paris, 1860. But much preparatory work had been done by Ogston, Percy, and other observers, whose work is but little known to the mass of medical readers in the present day. As their work is studiously ignored in certain quarters, it may be as well to commence with a *résumé* of their researches.

THE
SANITARY RECORD.
SATURDAY, OCTOBER 2, 1875.

MEAL-TIMES.

I.

'To everything there is a season, and a time for every purpose under the heaven,' says the preacher.

'What are the most seasonable times for meals?' is a question oftener answered than asked. Almost everybody has got a set of proverbs, dogmas, or traditional rules, derived apparently from his great-grandmother, on the subject, to which he contends the assent is due, not only of himself, but of all who have to discuss the matter with him. And very seldom does he ever seek to test these rules by the experience of others or physiological science. As is the case with all proverbial philosophy, no distinction of individual circumstances is made, and the particular instance is made applicable to the universal.

It is worth while to examine into some of these current notions about a necessity which occupies us and affects our comfort at least three times a day, and often has a serious influence on our future health also. And at the outset let it be stated that any universal rule about meal-times which takes no count of the occupations and bodily peculiarities of different persons must necessarily be wrong. It is absurd to require that the duties and pleasures of existence should give way to the task of supplying nutriment; that would indeed be '*propter vitam vivendi perdere causas*.' And it is equally absurd to ignore the idiosyncrasies of individuals induced by original constitution or acquired habit. Everybody who is led to think about a subject at all, in its bearing either on himself or his dependents, should honestly and fairly try during sound health experiments on the prevalent ideas concerning the arrangement of meals, and test how far the self-knowledge thus acquired is capable of application to social and professional requirements.

As an aid to his investigations it may be stated that the physiology of digestion confirms the truth of the following general observations bearing on the times of taking solid food and the intervals between them; it being assumed that the said food is of average digestible quality, and in quantity proportioned to the reasonable appetite, not in excess.

1. Food for the supply of the daily wants of the system is most rapidly and thoroughly digested when taken early in the day, ere the nervous and secretive forces are exhausted by toil.

2. Rapid digestion in the early part of the day contributes to the immediate demands of motion and innervation.

3. Food for the repair of the continuous wear and tear of the tissues is in less immediate request; the completeness of its solution is of more importance than the rapidity, and it is best taken towards the evening, when an opportunity is afforded for its leisurely absorption during sleep.

4. The duration of digestion bears a proportion to the quantity of food eaten.

5. In youth the digestion is quicker, and the stomach sooner emptied than in grown-up persons.

6. Rest before meals makes digestion more complete. Exertion immediately before meals retards digestion, and exertion immediately afterwards deranges it.

7. Sleep retards digestion, but makes it more complete.

8. Alcohol retards digestion and renders it also incomplete.

9. Earnest pre-occupation of mind retards digestion, and may even quite annul it.

10. Water quickens digestion, and encourages the absorption of fatty and saccharine matters; but its effect on the complete solution of albumen is doubtful.

There can hardly be two opinions among physiologists as to these facts. Few as they are, they may still clear up a considerable number of the misconceptions and contradictions begotten by the traditional empirical ideas regarding meals and meal-times. As an example, try what they have to say respecting—

Breakfast.

Let a healthy man really 'break' his 'fast' with a substantial meal, and not break his breakfast with irritating little nips or slops beforehand. After the stomach has at its leisure emptied itself during sleep of its contents, and sent them to repair the worn tissues and exhausted nerve force, and the blood has been ventilated and purified by washing and dressing with the window open, then is the time when the most perfect of all nutritive articles, farinaceous food, can be consumed in largest quantities with advantage. Butter also, and fat and sugar, troublesome customers to weak digestions, are then easily coped with, and contribute their invaluable aid to performing the duties of the day. For example, many persons, can drink milk to a fair and useful amount at breakfast, with whom it disagrees at other hours. And the widely advertised 'breakfast bacon' by its name warns the consumer against indulgence later on in the day. *Café au lait* and sweet creamy tea are to many men poisonous in the afternoon, though in the prime of the morning they are a wholesome beverage to the same individuals.

Let the vigour, good humour, and refreshment then felt by a healthy man be utilised without delay in eating a hearty meal immediately after he is dressed, and not frittered away in the frivolities of other occupations. Let not reading, or writing, or business—muscular, political, or economical—exhaust the nervous system. The newspaper and letters should not be opened, preferably not delivered, till the appetite is thoroughly appeased. A Christmas-box to the postman will probably set you in such a part of his beat as will keep these unexploded shells out of sight till the proper moment. Or, let the master of the house have a bag, and sufficient self-command to retain it locked till his household's stomachs are ready to receive the contents without spoiling a meal. Commercial men should insist upon being written to at their offices, and '*O Lectores benevoli*,' pray don't bother the doctors too early.

As to the hour of the clock at which breakfast should be ready, that must depend on the avocations of the breakfaster, on his dinner-time, bed-time, and time for rising. Practical and scientific members of agricultural societies say that the most important part of a prosperous farmer's work, be he great or small, is over by eight in the morning. The more acres he farms, the earlier must it begin. And this is not a light occupation, mind and body being earnestly active at the same moment, moving about quickly over a considerable space of ground and foreseeing the successful carriage of the day's labour. Many robust agriculturists fall into severe forms of dyspepsia, heart-burn, water-brash, intestinal neuralgia, emaciation, consumption, hypochondriasis, or, still worse, into dram-drinking and its baneful consequences, solely from attempting this task before they have fortified themselves by a breakfast. Purveyors of all perishable produce, butchers, fishmongers, green-grocers, market-women, etc., have laid upon them the same necessity of getting their most serious work over, and beginning the mechanical occupation of selling, by the hour when their customers are abroad. And medical men know how frequently these classes suffer from neglecting the precaution here enforced.

At the hour when these people are, or ought to be, taking their breakfast, or even later, there is a continuously recruited army of workers, purveyors of intellectual food, food as perishable and as eagerly hungered for as the last named, who are just sitting down to supper. They prepare themselves for rest, if prudent, by a moderate meal principally of animal food and fermented liquor, which they have then leisure to digest slowly and completely, so as to repair the wear of the bodily machine by the past toil. There should be no morning meal for them till afternoon, otherwise it proves a break-*rest* as well as a break-*fast*. There are in England many thousand persons employed nightly for the periodical press, and though the greater number, especially of the brain workers, are 'sicklied o'er with the pale cast of thought,' yet in their digestive functions and the nutrition of their tissues, they do not seem to suffer more than other sections of the industrial population. When they do suffer it is usually in consequence of being roused up too early in an attempt to join the established breakfast at the established family hour. The up-all-nighters, who cannot attempt this, complain less frequently than the mere late workers.

Those who are born to consume the fruits of the earth rather than to sow and reap them, will also do well to follow the same rule that we have recommended for their more industrious brethren. It is true they do not suffer so much from a neglect of it, but they will enjoy life much more by obedience. The adoption of what may be called the French use, namely, a cup of coffee or milk on rising, and nothing else till a heavy *déjeuné* about noon, is associated with a mode of life which fails to develope to their utmost the inborn capacities for exertion, and is being gradually discredited as the upper classes in Europe come more and more to find their pleasure in work.

Commercial men occupy an intermediate place between the classes already named; there is little

temptation to them to work fasting, and the current hour of the family breakfast usually suits them very well. The most frequent error they commit is that of swallowing the meal over hurriedly, and bolting their food. They are in too great haste to get to business. Sometimes they eat too much, in the vain hope of doing without luncheon harmlessly.

The balmy freshness of the morning air, further sweetened by contrast with that of a stuffy bedroom, the cheery scene of life and movement succeeding the sepulchral night, and a prevalent sensation of cleanliness and righteousness, combine to make the brushing of the rising dew seem a specially wholesome occupation. But any unprejudiced person may easily convince himself that this is a fallacy. Let him go in for a quick walk before his first meal, and compare his capacity for exertion after it with what it is if he breakfasts first and then goes through the exercise. If the weight of the meal is felt at the pit of the stomach we may be sure there is some error in the mode of taking it. Valuable as muscular exertion is to the health, especially of sedentary workers, they would be better employed in lying on the bed with the window open than in taking walks before breakfast, in cases where the meal cannot be got ready by the time they are dressed.

The drinks at breakfast should be scrupulously aqueous. Alcohol in any form, or at any time connected with breakfast, before, after, or in the middle, is injurious in direct proportion to its quantity. It induces a congested state of stomach and œsophagus after each dose, which prevents the immediate secretion of salivary and gastric juices, hardens the membrane, and causes atrophy of the secretory glands. And this effect more surely follows when the viscera are unprotected by the presence of unirritating food that might act as a diluent. There is no surer poison than the spirituous 'nip,' or vinous 'pick-me-up' before breakfast. In men it brings on hardening and puckering of the liver and kidneys, palpitations and dilatations of the heart, loss of elasticity in the muscles and arteries, followed by atrophy of the same, early old age and that pottering vagueness of mind which makes them in their latter years the terror of society. In women it causes hysteria, hypochondriasis, and chronic invalidism, as well as sometimes the same tissue degenerations found so certainly in the male sex. It is easy to understand alcohol doing this, when we think of it as arresting the digestion of starchy food, at the very time when that alimentary matter is most wanted to supply force for coming work, at the very time when the viscera are most ready to digest starch, and are most unprepared to resist noxious influences.

An instinctive craving for stimulants in the early morning is almost always the result of indulgence overnight. But with these miseries we have no sympathy, and, instead of the 'hair of the dog,' would preferably administer the 'tail of the cat.'

THE LOCAL GOVERNMENT BOARD ON VACCINATION PROSECUTIONS.

A CONTROVERSY is raging at Evesham to which the Local Government Board has contributed fuel in the shape of a letter, which we cannot think judicious. We need not discuss the details of the earlier stages of the matter further than to say that a certain Mr. Hensley, having been contumacious in regard to the vaccination of his child, was summoned for non-compliance with the 'Vaccination Act, 1867.' A conviction having failed to secure the required obedience, the subject eventually reached the Local Government Board, who gave their advice in a letter to the guardians dated September 17, 1875. We cannot say whether this letter is intended designedly to mark a new era in the vaccination controversy, but certainly it would seem to do so, and, to say the least of it, is somewhat inconsistent with the action of that Board in the Keighley case. The letter runs as follows :

Local Government Board, Whitehall, S.W.,
September 17, 1875.

SIR,—I am directed by the Local Government Board to acknowledge the receipt of your letter of the 7th instant, in which, with reference to the refusal of Mr. C. F. Hensley, of Broadway, to have his infant child vaccinated, you inquire whether the guardians of the Evesham Union have, under the Vaccination Acts, any discretionary power to abstain from taking further legal proceedings against persons who have once been fined for not complying with the law by having their children vaccinated.

The Board, in reply, direct me to state, for the information and guidance of the guardians, their views upon the question generally in connection with the law on the subject.

It is distinctly contemplated by article 16 of the Board's General Order of October 31, 1874, that, independently of any proceedings which may be taken against the person in default under section 29 of the Vaccination Act, 1867, the vaccination officer shall be authorised to take proceedings against him, if he continues contumacious, at least once also under section 31 of that Act. Until, therefore, proceedings under the latter section have been taken in a case, and a conviction obtained, the Board consider that the several means which the law provides with a view to ensure the vaccination of a child have not been used. The Board would here observe that, from the information in their possession, it is not clear whether all the means above alluded to have been resorted to in the case of Mr. Hensley.

The Board, at the same time, direct me to point out, that by article 16 of their above-mentioned order, it is provided that in any case in which a magistrate's order has been obtained and summary proceedings have been taken under section 31 of the Vaccination Act, 1867, no further proceedings shall be taken by the vaccination officer without the express instructions of the guardians. The intention of this provision is that the guardians should carefully consider, with regard to each individual case, the effect which a continuance of proceedings is likely to have in procuring the vaccination of the individual child, and in insuring the observance of the law in the union generally.

The Board may further state that it is on the one hand undeniable that a repetition of legal proceedings has, in numerous instances, resulted in the vaccination of a child when such vaccination had not been procured by the previous proceedings, and it is therefore important, with the view of securing a proper observance of the law, that parents should be well assured that proceedings, in case of non-compliance with its requirements, will not be lightly

discontinued. Under the other hand, the Board are prepared to admit that, when in a particular case repeated prosecutions have failed in their object, it becomes necessary to carefully consider the question, whether the continuance of a fruitless contest with the parent may not have a tendency to produce mischievous results, by exciting sympathy with the person prosecuted, and thus creating a more extended opposition to the law.

The Board entertain no doubt that in all cases of the kind in question, the guardians having before them the preceding observations, will not fail to exercise the discretionary powers confided in them in the manner best calculated to give effect to the policy of the law. I am, sir, your obedient servant,

FRAS. FLETCHER, Assistant-Secretary.

Mr. H. Wadams, Clerk to the Guardians of the Evesham Union, Hampton.

It must be concluded from this letter that the Local Government Board wishes to temporise as if afraid to push matters to the extreme of vindicating the law. Under these circumstances it would not have been surprising had the Evesham guardians taken the cue from their superiors and in their turn temporised. It is, however, much to their credit that they have not shirked the responsibility thrown upon them by the Central Authority, as they might well have done having regard to the vacillation shown in high places. The guardians have in point of fact, by a vote of twelve to nine, instructed their vaccination officer to institute a further prosecution of the rebellious Hensley. It does not appear whether there exists at Evesham any considerable or organised opposition to compulsory vaccination, but the weakness and irresolution apparent in the letter of the Local Government Board will assuredly embarrass the guardians in their public-spirited endeavour to vindicate the law, and may even encourage agitation and ill-will not only at Evesham but in the country generally. The fanatical opponents of vaccination have thus received encouragement whence it could least have been expected.

HOUSEHOLD BOILER EXPLOSIONS.

THERE can be no doubt that the coming winter will bring the usual number of fatal accidents, and work the usual havoc with those parts of the dwellings in which are placed the boilers that heat the water for culinary and lavatory purposes. And it is lamentable to think that in every case the ruin will result from a neglect of the most ordinary precautions, and from the disgraceful blundering of our domestic engineers. Surely enough of damage has been caused by these miserable defaults in construction, and the time has arrived when they should cease to obtain amongst us. Repeatedly, the sources of these explosions have been explained, and although some little good has resulted, still the bulk of the boilers which are inserted in houses are of the usual unprotected type, and are presided over by luck merely.

Householders should, by this time, have arrived at the fact that it is not safe to enter into a new dwelling or occupy an old one without just as much inspecting the kitchen-boiler arrangements as ascertaining the sanitary condition of the drains. The latter precautions are fortunately now regularly enough taken, but the former are but seldom specified for examination by the engineer. Nevertheless, they should be taken into account by him, and he should be requested to pay the most particular attention to this very important portion of the house economy. The working of the cylinder system has been frequently explained in the works of Mr. Eassie and others, and we now print this week a most valuable paper written by Alderman Bailey of Salford in which our readers will find laid bare the majority, if not all of the causes, which conduce to explosions. It is hoped that the public press will not cease to explain how culpable it is to begin the winter without a thorough overhauling of the hot water apparatus of each house; the affixment of proper safety valves; and, if found necessary, the removal of faulty boilers and their replacement by the improved systems.

Notes of the Week.

MR. ALBERT BRASSEY, of Heythrop, has sent a donation of fifty guineas to the Model Houses Association for Improving the Dwellings of the Industrial Poor, and the Diffusion of Sanitary Knowledge, 121 Pall-Mall.

ALDGATE PUMP.

WE received lately from the Rev. S. A. Barnett, Vicar of St. Jude's, Whitechapel, a sample of water collected by him from the far-famed Aldgate Pump, of which he appears to entertain some just suspicions, notwithstanding the far spreading reputation of this great civic institution. We have had this sample analysed by Mr. J. A. Wanklyn; his report shows that the water contains of solids 88; chlorine 11·1; ammonia, free, 0·01, albuminoid, 0·76. It is, therefore, positively impure, contaminated and dangerous water.

SULPHUR IN COAL-GAS.

AT a recent meeting of the British Association, Mr. Vernon Harcourt, president of the chemical section, described an apparatus for the estimation of sulphur in coal-gas. By the present system of gas making it seems impossible for gas manufacturers altogether to prevent sulphur, in the form of bi-sulphide of carbon, from contaminating the gas, and as Parliament has fixed for the metropolitan companies a limit for the impurity beyond which they may not go, it is a desideratum to have a simple and approximately correct process for the estimation of the amount of this impurity. Especially is this the case in large works, where the nature of the gas is constantly changing, and where it is desirable to have a constant check upon the manufacture. By the present process this estimation takes about twenty hours. Mr. Harcourt has, however, succeeded in devising a process which much facilitates the operation. It is founded upon the following facts:—When bi-sulphide of carbon is heated in presence of hydrogen, it is decomposed into sulphuretted hydrogen, and this sulphuretted hydrogen has the property of converting a lead salt into the black sulphide of lead. The estimation is made in the following manner:—A volume of coal gas is passed

through a flask filled with small pebbles, kept at a low red heat, when the above reaction takes place; the gas is then passed through a solution containing a lead salt, until a definite brown or black tint is produced. This tint is compared with a standard colour, and the amount of sulphur in the gas is calculated from this.

EPPING FOREST.

THE Epping Forest Commissioners possess, it would seem, an *embarras de richesses*, in the shape of 'schemes' for the future preservation and management of the forest. No less than twenty-two different schemes have been presented from various quarters, and the Commissioners are to hold a special meeting during the course of the present month in order to consider the subject dealt with in the schemes and the schemes themselves. As already intimated in the SANITARY RECORD, the most important of these proposals respecting the future management of Epping Forest are those made by the Committee of the Epping Forest Fund, and by or on behalf of the Corporation of London. At the meeting last week of the Metropolitan Board of Works their solicitor brought up the 'scheme' which has been adopted by the board for the preservation of Epping Forest, together with copies of the schemes prepared by other bodies and persons; and in a conversation which ensued it transpired that the proposals made by the board itself respecting Epping Forest had been carefully and minutely considered before adoption and before being submitted to the Epping Forest Commissioners.

A movement has recently been started in an opposite direction to that having for its objects the preservation of Epping Forest, and the retention of the area of forest land which has been recovered from illegal enclosure. The promoters of this new movement are certain persons who have formed themselves into an association, under the name of 'The Epping Forest Landowners' Protection Society.' The object of this society is declared to be 'to protect the rights and interests of those persons, who since 1851 have acquired for valuable considerations their properties in the forest.' There has been a talk too of an 'appeal' against the celebrated judgment of the Court of Chancery, in the suit instituted by the Corporation of London in defence of the public rights in Epping Forest. But it is probable that it is no more than 'a talk.' Meanwhile the Corporation of London propose on the 14th of this month to hold a festival in commemoration of their victory in the Epping Forest case. Some 600 guests are to be invited, and these will include in all probability a number of members of both houses of parliament. The festival will be preceded by a visit of the Corporation and their friends to the forest.

DIGGING UP HOUSES.

WE do not purpose speaking of Pompeii or of Herculaneum, as the above heading might not unnaturally suggest, but of Balham, a quiet London suburb. In a field, within five minutes' walk of the railway station at that place, two semi-detached villas have (almost literally) been recently dug up. At any rate, it is only a few weeks since that the bulk of the materials of which they are composed rested beneath the green sward whose site they now occupy. Gravel and burnt clay, together with a little Portland cement and some water, are the ingredients employed. These are judiciously blended, and when moulded into blocks between plates of wrought iron appear to form admirable and very cheap substitutes for brick-work. The plan for converting these simple elements into the side walls of dwelling-houses is that known as Drake's, and has been patented by the London firm of that name. What may be termed a skeleton scaffolding, of light wrought iron, and therefore of a very portable character, is the vital feature of the scheme. The uprights of the scaffolding are perforated with small holes at about a foot apart. Into these holes iron pins fitting loosely are placed at heights which may be varied as the walls grow up. Upon the pins rest boxes of sheet iron for the reception of the components of the concrete as named above. Very speedily the mixture hardens, and in that condition it resembles in texture, though not in colour, the coarse asphalte now so much used as a substratum for pavements.

When one course of blocks—in the case to which we refer about twenty inches in width and ten inches in thickness—is completed the moulds are raised by the means described and again filled with concrete. Thus the work goes on rapidly until the walls are of the requisite height for the reception of the roof. Bond timbers are introduced at intervals, their ends being 'flush' with the face of the walls of the various rooms, and these will serve eventually for attaching the joiners' work without risk of disturbing the concrete. The latter is said to become so hard and tough as that blows from sledge hammers can work no mischief upon it. Eventually a facing of compost and a coat of paint will finish the villas externally.

The merits of this mode of building are, durability and cheapness. The villas referred to will not cost more than half the amount of ordinary houses of a similar kind, and yet they cannot fail to be quite as lasting. The work is done mainly by unskilled workmen, who only require the supervision of one or two inspectors.

In the case of this description of concrete houses at Balham, great and exceptional advantages existed. The clay and the gravel required lay immediately below the surface, and that which was removed to make room for the foundation of the houses now forms part of their side walls!

The success of such works as those of the Messrs. Drake cannot fail to be of interest to all concerned in the production of sanitary as well as of social science.

'Better houses at smaller cost, and how to get them,' is assuredly a problem in the solution of which all must feel directly or indirectly a considerable share of anxiety.

AN IRISH CABBAGE GARDEN.

AT a meeting of the Committee of the Dublin Sanitary Association the following resolution was passed.

'That this committee are strongly of opinion that the so-called Cabbage Garden Burial Ground, near St. Patrick's Cathedral, should not be used for purposes of interment in future.'

They base their opinion, amongst other reasons, on the fact that the graveyard is in the midst of a crowded and sickly neighbourhood, is closely contiguous to several dairy-yards, and in dangerous proximity to the Meath hospital.

It was also resolved 'That a sub-committee be appointed to inspect the so-called Cabbage Garden Burial Ground, and to investigate the legal bearings of the question as to future interments in that graveyard.'

As 'cabbage garden' may seem to our readers to be rather a ludicrous name for a cemetery, we may mention that 'cabbage' is a corruption of 'Capuchin,' and that the 'cabbage garden' is believed to have been the garden or churchyard attached to a Franciscan monastery of 'Capuchin' friars. The origin of the foregoing resolution is as follows. The cemetery in question has been long attached to the parish of St. Nicholas Without. This parish had its church situated in the north transept of St. Patrick's cathedral. On the restoration of the cathedral the Church of St. Nicholas was thrown into the general body of the cathedral, and the parish amalgamated with an adjoining parish. On the passing of the Irish Church Act, any burying grounds not attached specially to a church, or which was not private property, became vested in the board of guardians of the union in which it was situated. Thus the old Capuchin Garden came to be vested in the Board of Guardians of the South Dublin Union. The guardians, after the not unfrequent manner of so-called 'guardians' of the poor, have determined to utilise the cabbage garden to the

fullest extent and use it for the burial of paupers. The ground had fallen into comparative disuse, about 100 burials having taken place therein last year, and in some years not so many. Our correspondent visited the ground, and found that it comprised about an acre and a half of land situated in a densely populated neighbourhood within 120 yards of the Meath Hospital, within eighty yards of a large charity school, and within thirty yards of one of the most densely populated and sickly blocks of buildings in Dublin, a narrow lane passing through this block of buildings is the only approach to the graveyard. Not only is this the case, but a court consisting of a number of small cottages has about 100 feet of the back walls of these cottages formed by the boundary wall of the graveyard. Our correspondent thinks that the ground is already fully occupied by graves. The care-taker stated that it was not an unconmon thing for coffins containing bodies to be left at night in the cemetery without any name. On one occasion he found two coffins thus left in old disused vaults. When such were found they were buried without an inquest. It must here be remarked that next to this 'cabbage garden' is a place known as the 'Long Lane Lime Kiln,' a celebrated resort of Dublin outcasts. We think that the existence of a cemetery where nameless bodies can be disposed of without inquiry, only separated by a wall from such a resort as the 'Long Lane Lime Kiln' is suggestive, to say the least of it, of rather a low state of supervision on the part of the authorities. It is quite manifest that the cabbage garden is a place quite unfit for use as a cemetery, and it is the duty of the sanitary authorities to take immediate steps for closing it.

The Health of Watering Places.

XVI.—WHITBY.

THE fortunes of Whitby as a commercial town and port have been of a fluctuating character during the last seventy years. The census returns afford a pretty accurate means for judging of the prosperity and trade of a town. In 1801 the township of Whitby had a population of 7,483 persons, which, after a decline in 1811, rose to 8,697 in 1821; during the next twenty years the population declined to the 7,383 enumerated in 1841, which number was a hundred lower than that in 1801. Between 1841 and 1851 an increase again prevailed, and 8,040 persons were enumerated at the census in the latter year, which further slightly rose to 8,142 in 1861; whereas at the last census in 1871 only 7,886 persons were counted within the township. Thus in the seventy years 1801–71 the population of Whitby township only showed an increase of 403 persons. The decline of ship-building in Whitby, and of the town's connection with the whale fishery, has caused a decrease in the importance of the place as a trading port, which has only been partially balanced by its growth in favour as a watering place and health resort.

The Improvement District of Whitby includes nearly the whole of the townships of Hawsker-with-Stainsacre and Ruswarp as well as that of Whitby before mentioned. These two townships had in 1801 a population of 2,114 persons, which in 1841 had increased to 2,603. As far as may be judged from the census reports, the growth of Whitby as a watering place appears in great measure to have taken place in these two townships of Hawsker and Ruswarp, as their population showed an increase of 15·2 per cent. during the ten years 1841–51, 38·5 per cent. between 1851–61, and 41·4 per cent. during the last decade 1861–71. The population enumerated in these two townships increased during the thirty years 1841–71 from 2,603 to 5,108, thus nearly doubling itself. The population of the three townships which constitute the Parliamentary Borough of Whitby, and which we intend to take to represent the Improvement District and watering place, showed an increase of rather less than 400 in the forty years 1801–41, but increased steadily from 9,986 in the latter year to 13,094 in 1871. Thus, whereas the population of what may be called old Whitby remained stationary, and that of new Whitby has rapidly increased, the inhabitants of the Improvement District, which includes both, steadily increased during the thirty years 1841–71. If the rate of increase which prevailed between 1861 and 1871 has since been maintained, which as we shall be able to show there is no reason to doubt, the population of the three townships may be estimated at 13,452 in the middle of 1874, and at 13,564 in the middle of this year.

The registration sub-district of Whitby, which in the Registrar General's annual Watering Place Table is taken to represent Whitby as a health resort, only differs from the Improvement District, or urban sanitary district of Whitby, inasmuch as it also includes the rural township of Fylingdales, which had a population of 1,568 persons in 1801, and of but 1,558 in 1871. The population of this township, including the villages of Robin Hood's Bay, Thorpe, Stone Brow, and Normanby, may be described as stationary, although it increased from 1,568 in 1801, to 1,784 in 1851, and declined again to 1,558 in 1871. The inclusion of this small rural population in the registration sub-district of Whitby has too small an effect upon its vital statistics to forbid the acceptance of the sub-district figures as fairly representing the sanitary condition of Whitby as a watering place. We may mention that judging by the figures for 1874, the sanitary condition of this small rural population of Fylingdales township cannot be very satisfactory, as the death-rate in the sub-district for that year was (after correction for workhouse deaths) 21·1 per 1,000, whereas in the Improvement District, after a similar correction, it was 20·7. This is conclusive evidence that the death-rate in this small rural township was higher than that in the three townships of the Improvement District. This is a matter for the attention of the rural sanitary authority of Whitby.

The average annual birth-rate in Whitby sub-district during the ten years 1861–70 was equal to 34·9 per 1,000, and during the first four years of the current decade it has averaged 35·9 per 1,000. The birth-rate in the Improvement District in 1874 was 35·8 per 1,000. The recent increase in the birth-rate may be taken as evidence that the rate of increase in the population of Whitby since 1871 has been maintained fully at the rate which prevailed during the last decade, even if this rate has not been somewhat exceeded. Hence it may be assumed that the estimated population of the watering place upon which the vital statistics contained in this article and in the Registrar General's table are based, are sufficiently trustworthy for the purpose. It may be noted, however, that a continued increase in the birth-rate of Whitby would afford ground for local inquiry as to its population, as an under estimate of its population would cause its death-rate to be over stated. At present, however, there is no ground for believing that this is the case.

The annual rate of mortality from all causes in Whitby sub-district during the decade 1861–70 averaged, after a correction for the deaths of inmates of the workhouse admitted from other parts of the union, 23·6 per 1,000. During the four years 1871–4, the annual death-rate in the sub-district, after a similar correction for workhouse deaths, was 18·7, 23·1, 21·2, and 21·1 per 1,000 respectively; thus the death-rate during the last four years has averaged 21·0 per 1,000, showing a decline of 2·6 per 1,000 from the excessive rate which prevailed in the preceding ten years. In the entire union or registration district of Whitby, which includes a large rural area in addition to the sub-district of Whitby, the annual death-rate from the seven principal zymotic diseases averaged so much as 4·4 per 1,000 during the ten years 1861-70. In the sub-district this zymotic rate was equal to 3·8, 4·3, 1·6, and 2·9 per 1,000 respectively, during the four years

1871–4. The mortality from these diseases has showed a decline in recent years from the excessive rate which previously prevailed. We may notice that small-pox prevailed in Whitby in the latter part of 1871 and the beginning of 1872; and measles in the autumn of 1872. Scarlet fever has been more or less prevalent, except during 1873, since the beginning of 1871, and that whooping-cough was epidemic in the spring of this year. Having thus used the sub-district figures to note the principal features of the mortality in Whitby during recent years, we will now proceed to examine in greater detail the facts for the three townships of the Parliamentary Borough taken to represent the Improvement District, relating to 1874, with a view to estimate its sanitary condition.

During the year 1874 the deaths registered within the three townships comprising the Parliamentary Borough of Whitby were 287, which, after the deduction of nine that occurred in the workhouse and are estimated to have been of paupers admitted from portions of the union lying outside the district, were equal to an annual rate of 20·7 per 1,000 of the estimated population. In the fifteeen other watering places previously dealt with, the rate of mortality during 1874 ranged from 15·3 and 15·4 in Eastbourne and Ramsgate, to 22·3 and 25·2 in Yarmouth and Rhyl; among these fifteen watering places, the death-rate last year was below the Whitby rate in twelve, whereas it only exceeded the Whitby rate in Southport, Yarmouth, and Rhyl.

The deaths in Whitby Parliamentary Borough last year included fourteen which were referred to scarlet fever, six to diphtheria, ten to different forms of fever, three to whooping-cough, eight to diarrhœa, six to measles, and not one to small-pox; in all, forty-seven deaths resulted from these seven principal diseases of the zymotic class. These forty-seven deaths were equal to 16·4 per cent. of the deaths from all causes within the borough, and to an annual rate of 3·5 per 1,000 of its population. Among the fifteen English watering places, previously referred to, the percentage of deaths from these seven zymotic diseases to total deaths in 1874, which, as we have just stated, was equal to 16·4 in Whitby, ranged from 5·6 and 7·6 in Eastbourne and Scarborough, to 27·7 and 28·8 in Weymouth and Yarmouth. The death-rate per 1,000 of the population from these diseases ranged from 0·9 in Eastbourne, and 1·4 both in Llandudno and Scarborough, to 3·6, 5·7, and 6·4 per 1,000, respectively, in Southport, Weymouth, and Yarmouth. These last three mentioned were the only watering places of the fifteen in which the fatality of the principal zymotic diseases in 1874, whether measured by its proportion to the total mortality, or to population, exceeded that which prevailed in Whitby. Judged by this important test, the sanitary condition of Whitby in 1874 was more unfavourable than that of twelve out of these fifteen watering places.

It will be useful briefly to consider in greater detail this zymotic fatality in Whitby during 1874. Scarlet fever only caused one death during 1873, and not one in the first quarter of 1874, whereas fourteen were recorded in the last three quarters of the year; five occurred in Church Street, three in Ruswarp, and two in Flowergate. The deaths referred to fever in Whitby sub-district were seventeen in 1871, whereas they declined to nine and six in 1872 and 1873. During 1874 ten fatal cases of fever were registered within the Parliamentary Borough, of which three occurred in the first, three in the second, and four in the third quarter of the year; two were certified as typhus, seven as enteric or typhoid, and one as simple continued fever. The ten deaths from fever included two in Church Street and one each in Ruswarp, Flowergate, and the workhouse. The six deaths from diphtheria, of which five occurred in Ruswarp and one in Flowergate, showed an increase upon the numbers in recent preceding years. Measles, to which no death had been referred during 1873, caused six deaths in 1874, of which five occurred in the first half of the year; one fatal case was returned both in Church Street and Ruswarp. The three fatal cases of whooping-cough included two in Ruswarp and one in Church Street. No death has been referred to small-pox since the middle of 1872, previously to which the disease prevailed epidemically and caused twenty-seven deaths in nine months. It may be hoped that the immunity from this disease which has prevailed in recent years has not induced apathy and neglect in the matter of vaccination, as any community which contains a large proportion of unvaccinated persons is in continual danger of an epidemic of small-pox. We have never heard of the disease assuming an epidemic form among well vaccinated populations, although where an epidemic prevails, a small proportion of the vaccinated frequently suffer with the unvaccinated. Medical officers of health should always be in a position to know the proportion of unvaccinated persons in the population under their sanitary control. Indeed, it may be hoped that ere long the responsibility in the matter of vaccination will be taken out of the hands of poor-law guardians, and placed, together with all other matters relating to the public health, under the control of the various sanitary authorities, in which case it would naturally come within the province of the medical officer of health. The eight deaths referred to diarrhœa in Whitby Parliamentary Borough during 1874, included two in the second, four in the third, and two in the fourth quarters of the year, not including a death certified from cholera at Boulby Bank. Of these eight fatal cases of diarrhœa, only three were of infants under one year of age; the four returned in the third or summer quarter of the year were equal to an annual rate of 1·2 per 1,000 during the three months. The annual death-rate from diarrhœa during the summer quarter of 1874, ranged in the fifteen other English watering places from 0·0 and 0·9 in Eastbourne and Llandudno, to 3·5 and 4·9 in Lowestoft and Margate. It is a satisfactory feature in the mortality returns of Whitby that the death-rate from diarrhœa has steadily declined during the four years 1871–4.

The deaths referred to phthisis and to diseases of the respiratory organs in Whitby during 1874 were fifteen and forty-seven respectively; the death-rate from phthisis was equal to 1·1, and that from diseases of the respiratory organs to 3·5 per 1,000 persons estimated to be living in the Parliamentary Borough. As Whitby has not become, like many other watering places, a favourite health resort for confirmed invalids and phthisical patients, these rates may be taken fairly to represent the proportional mortality from these diseases among the resident population of Whitby. In ten other watering places for which similar figures have been obtained the death-rate from phthisis (which was 1·1 in Whitby) ranged from 0·9 and 1·4 in Llandudno and Folkestone, to 3·0 and 3·3 in Southport and Rhyl; the phthisis rate in Southport is undoubtedly raised by imported cases. The death-rate from diseases of the respiratory organs, including bronchitis and pneumonia, which was so high as 3·5 in Whitby, ranged in the other watering places from 1·8 in Worthing, to 3·2 in Llandudno and 3·6 in Dover. The high death-rate in Whitby during 1874 from the inflammatory diseases of the respiratory organs, combined with the low death-rate from phthisis is note-worthy, and the subject deserves further investigation. It may be mentioned that of the forty-seven deaths referred to diseases of the respiratory organs in Whitby during last year, no less than thirty-two resulted from bronchitis, including eighteen of infants and young children, and eleven of persons aged sixty years and upwards.

It is matter for regret that the cause of death in inquest cases, as entered in the Whitby death-register is so often unsatisfactory. In three cases of sudden death from natural causes during 1874 the cause of death was returned as 'Visitation of God.' The primary object of the holding of inquests is undoubtedly to discover whether deaths have resulted from natural causes or from violence, but it should also be remembered that in inquest cases the death-register

is entirely dependent upon the verdict for information as to the cause of death, and for this purpose such a verdict as 'Visitation of God' is utterly useless. Even in cases when no *post mortem* examination is made, we presume that some medical evidence is usually forthcoming to warrant a decision that death did not result from violence, and it is infinitely desirable that some clue to such evidence should be incorporated with the verdict. If the evidence does not authoritatively decide the cause of death the form of the verdict would advantageously run as follows. 'Natural causes, probably heart-disease,' or apoplexy, or bronchitis, as the case may be. It certainly appears an anomaly that the county rates should bear the expense of an inquest in order to ascertain the cause of a death, and that the cause of such death should be returned as 'Visitation of God,' a form of expression which appears to us objectionable from every point of view.

It will be useful now to glance at the rate of infant mortality in Whitby, as this affords one of the tests of sanitary condition, which is very generally accepted as trustworthy. Measured by the proportion of deaths under one year to births registered, infant mortality in Whitby sub-district was equal to 155 per 1,000 in 1871, and to 113 and 129 in 1872 and 1873. Within the Parliamentary Borough in 1874 infant mortality, measured in this way, was equal to 131 per 1,000, which although lower than the rate in 1871, showed a further increase upon the rates in 1872 and 1873. Infant mortality in the whole of England and Wales during 1874 averaged 151 per 1,000; the rate in Whitby was therefore 20 per 1,000 below the average English rate. In the fifteen other watering places, previously referred to infant mortality, thus calculated, was but 95 and 98 per 1,000 in Worthing and Llandudno, while it ranged upwards to 180 and 187 in Rhyl and Southport. The infant death-rate in Scarborough during 1874 exceeded that in Whitby by 22 per 1,000, although in most other particulars the Scarborough mortality was by far the most favourable. The sixty-three deaths of infants under one year of age registered in Whitby during 1874 included seven which were referred to zymotic diseases, two to syphilis, three to mesenteric disease and hydrocephalus, thirteen to diseases of the respiratory organs, twelve to premature birth, two to suffocation, and twenty to the indefinite causes—convulsions, atrophy, and debility.

Assuming that the age-distribution of the population in the Parliamentary Borough of Whitby in 1874 was the same as that which prevailed in the entire sub-district at the time of the last census in 1871, the number of persons living in the borough at the middle of 1874, aged upwards of sixty years, may be estimated at 1,326, and as eighty deaths at these ages were registered during the year, the death-rate was equal to 60·3 per 1,000. This death-rate among elderly persons in Whitby was 11·3 per 1,000 below the average death-rate at these ages in the whole of England and Wales during the year; in the fifteen other watering places it ranged from 56·4 and 56·6 in Weymouth and Lowestoft, to 70·9 and 79·1 in Llandudno and Rhyl. The proportion of elderly persons in the Whitby population in 1871 was equal to 9·9 per cent., which was higher than that prevailing in most of the other watering places; this high proportion is probably in great measure due to the situation of the union workhouse in the sub-district.

Before concluding this examination of the recent mortality statistics of Whitby it will be necessary to notice briefly the figures relating to the first half of this year. The annual death-rate in Whitby sub-district was equal to 29·4 in the first and to 24·2 in the second quarters of the year; and the rate from the seven principal zymotic diseases was 4·1 and 3·8 per 1,000 respectively. Thus in the six months the rate from all causes was 26·8, and from the principal zymotic diseases 4·0, each showing a large increase upon the rates, then excessive, in recent years. The increase in the general death-rate during the first half of this year was undoubtedly due, in great measure, to the unusual severity of the weather during last winter and spring; the high rate of zymotic fatality, however, appears fairly referable to unsatisfactory sanitary condition. The epidemic of scarlet fever which prevailed in Whitby during the latter part of 1874, caused twelve deaths in the March quarter of this year, including five in Ruswarp, three in Church Street, and two in Sandgate. The high zymotic rate in the four quarters was principally due to an epidemic of whooping cough, which resulted in seven deaths in Church Street, and two in Ruswarp. Of the four deaths referred to fever in the six months, one each occurred in Church Street, Ruswarp, Sandgate, and Haggersgate.

The conclusion to be derived from the foregoing consideration of the recent mortality statistics of Whitby is not favourable to the sanitary condition of this town and watering place. So high a death-rate, both from all causes, and from zymotic diseases, cannot but prove highly detrimental to the best interests of a town, the prosperity of which depends in great measure upon its reputation as a health and holiday resort. It is impossible now to refute the intimate connection between sanitary condition and the death-rate, and the advantages derived by Scarborough, Llandudno, and many other watering places, not to mention larger towns, from intelligent earnestness in sanitary matters should supply the necessary incentive to other communities to follow in the same footsteps. It is not for us, who have not the necessarily intimate local knowledge of Whitby, to suggest what should be done in that town to improve its sanitary condition and to reduce its death-rate. To the sanitary authority of the town, however, with the professional assistance of their medical officer of health, Dr. J. Taylerson, this task need present no insuperable difficulties, if undertaken with the determination to do what is necessary. Until lately, however, sanitary matters have been somewhat neglected in Whitby.

For the benefit of those of our readers who may have little local knowledge of Whitby, it may be useful to refer to one or two matters which have a direct bearing upon the health of the town. First as to the drainage. It appears almost incredible that, in any place depending in great measure upon its reputation as a health resort, the whole of the sewage of a town of more than 13,000 inhabitants should be emptied into the harbour; and yet such is still the case with Whitby. The drawback to the enjoyment of Whitby, as a watering place, to say nothing of its health, arising from the condition of the harbour, especially at low water, has attracted considerable attention among the visitors during the season just ended, as we can aver from personal experience. This serious and dangerous defect in the sanitary condition of Whitby, has, however, been some time under the consideration of the sanitary authority, which stands pledged to the Local Government Board, as the central health authority, to carry out without delay a comprehensive and complete system of sewerage for the town. On September 7 the Chairman of the Improvement Commissioners reported that Mr. Mausergh, C.E., was then engaged in making a survey of the town preparatory to reporting on the drainage. The form of this announcement does not appear to promise a very early completion of the new drainage system, until which time the present waste of life in Whitby cannot be checked, and it will be impossible to recommend this town as a safe and desirable health resort. The season of 1875 may now be said to be over, and we would earnestly recommend the sanitary authority to take such steps as will secure the completion of this new drainage system before the period in 1876, when holiday-makers will be called upon to make choice between the various advantages offered by the numerous watering places which now compete for public favour.

As to the water-supply, Whitby, is especially fortunate, as the town possesses an unlimited supply of the purest water, the source of which is Hazelhead, a place on the moors situated about ten miles from Whitby. The water is supplied on the constant system, at such a pressure that a simple hydrant will throw it over the highest houses

in the town. The water-supply is in the hands of a company, which is a financial success.

Although the union workhouse possesses a well appointed infirmary, it is available for none but pauper patients, and it is to be hoped that the recommendation of the medical officer of health to the effect that the urban sanitary authority should provide itself with independent accommodation for the isolation and treatment of non-pauper cases of infectious diseases, in a suitable situation at the outskirts of the town, will not only be considered, but speedily carried into effect. The advantages of a mortuary for the use of those families among the working classes whose living and sleeping space is limited would also be an undoubted sanitary advantage.

The dwellings of the working classes in Whitby, especially in its older portions, should also be critically examined, bearing continually in mind that as the strength of a chain depends upon that of its weakest link, so the health of a town may be said to depend upon the sanitary condition of its poorest classes and of their dwelling-houses. Although the provisions of the recent Artisans' Dwellings Act do not apply to Whitby, as its population is under 20,000, such a code of by-laws as is recommended by the Local Government Board, and sanctioned by the Sanitary Acts of 1872 and 1875, would give urban sanitary authorities plenary powers to deal with any dwellings which may be condemned as dangerous to health.

Bearing in mind the undoubted defects in the present sewerage of Whitby, and the mischief arising from the use of the harbour as its outfall, which sufficiently account for the high death-rate and fatality of zymotic disease; there is even reason to believe that Whitby possesses great natural advantages as a health resort. Of this the foregoing figures, indeed, afford some evidence. The rate of mortality among infants and elderly persons in 1874 was lower than in many watering places in which the general death-rate was considerably below that in Whitby; and the proportional fatality of both phthisis and diarrhœa was below the average.

We shall be much surprised if, after the completion of the necessary sanitary work in Whitby, the town does not take a high place among healthy watering places. Until this, however, is carried out, the health and prosperity of the town must inevitably pursue a downward course. In the mean time we cannot but regard it as a mistaken policy which prevents the publication of the medical officer of health's periodical reports upon the sanitary condition of the Improvement District, which would in all probability stimulate sanitary progress in the town, by impressing upon its rate-payers the necessity for a liberal expenditure in order to improve the health of the town. Such expenditure is not only necessary in order to keep pace with the sanitary improvement now in progress in so many other watering places, but would in the end prove a sound and remunerative sanitary investment.

In old times Whitby was known chiefly for its abbey, and as a place of some small commerce. At a more recent period the discovery of alum gave an impulse to its trade; it became a considerable fishing port later, in fact, one of the most important stations for the herring fishery; and now, lying close to some of the parts of Yorkshire richest in iron and coal, it has grown into a place of considerable importance, numbering 13,000 inhabitants. Within the last twenty years it has been thought of as a health resort, and has gradually become so popular that the number of its annual visitors has been reckoned at 60,000. They congregate chiefly in the new town, on the terraces of the West Cliff.

Whitby, with its ruined abbey, forms a picturesque object from the sea. It is built on very broken ground, and it is difficult to move about in it without ascending or descending. People are greatly divided in their opinions of Whitby, liking or disliking it very much as they object or not to the steepness of its streets. In any case every one must admit that there is much to admire in the bold coast scenery in and around Whitby. There is a long, excellent beach for bathing (the sands extending for nearly three miles to Sandsend), and the usual supply of bathing machines. There is a handsome bath-house on the pier, and baths can also be had in some of the hotels.

It is a great addition to the virtues of a bathing-place, when it can offer a mineral water to drink as well as the sea to bathe in. Whitby possesses a very fair chalybeate at Bagdale. It is moderately pure and moderately strong. It is used to some extent, but, partly in consequence of its situation, it is not much taken advantage of. Had it been near the West Cliff, which the visitors frequent, or had it been in connection with pleasure-grounds, it would doubtless have been more employed. We are informed that there are some small chalybeate springs on the side of the cliff. They are now entirely neglected; but if they were opened, and turned out to be tolerably strong, and if a little capital were expended on them, so as to make them attractive, they would be a considerable addition to the advantages of Whitby. The walk to a spa before breakfast and a draught or two of cold spring water, even if the mineral constituents are not very abundant or potent, are useful hygienic measures.

As compared with Scarborough, the air of Whitby should be more bracing, as the latter town faces the north or north-east, while the former faces the east and south-east; but the climate of the two is essentially the same, though Scarborough is a little more sheltered.

The principal promenade is on the West Pier, which runs for 800 yards into the sea.

We need not describe the inner and outer harbour, which is, unfortunately, only a tidal one; the old town, on the East Cliff, and the new houses on the West Cliff, nor the usual means of recreation, in which Whitby is not deficient. Sea-fishing may be followed here; and the angler may find occupation along the Esk—one of the numerous rivers so called in Great Britain—numerous owing to the simplicity of the name, which merely means water. Plenty of excursions can be made to spots in the neighbouring country, and especially to those which we have recently mentioned as being about to be opened up by the new railway. All these excursions are detailed in the guide-books.

Whitby is an excellent place for the study of natural history, and of geology in particular; and the admirable museum is no small aid to the student. And here we would say, that one of the advantages of taking a family to the sea-side is the opportunity it gives of early inspiring children with a fondness for natural history. Let them collect flowers, and sea-weed, and shells, jelly fish, and all the objects usually cast ashore; let them have microscopes too, if only to play with. They will pick up a practical knowledge of natural objects, and may acquire a taste for such pursuits, which may prove an amusement through life. Besides this, if a little care is taken to prevent over-exertion, they are strengthening their constitutions by long rambles along the shore, and by constant exposure to the sun and to the sea-breeze. More distant excursions, too, if judiciously managed, are not merely amusing but of considerable hygienic value, to adults as well as to children.

We need scarcely say that the neighbourhood of Whitby is very attractive to the geologist. The fossils of the upper lias, including Plesiosauri and Ichthyosauri, may be here studied. No one leaves Whitby without buying polished sections of its ammonites. There are sections of the strata in Robin Hood's Bay of much interest.

Then the search of workmen for beds of jet, which are found near the bottom of the upper lias, both on the shore and some distance inland, is, owing to its uncertainty, often very exciting. Whitby, as everyone knows, is the great seat of the jet trade and of the manufacture of the ornaments made of it.

For those who are interested in economic geology, there are the alum shales and alum manufactory, and the whole Cleveland iron-stone district is in the immediate vicinity.

Law Reports.

DAMAGE TO WORKS.

R. HARRIS has been summoned before the South Molton magistrates, at the instance of the inspector of nuisances of the rural sanitary authority of Torrington, for having in the months of January or February last, at Winkleigh, wilfully damaged, or caused to be damaged, certain works and property belonging to the Torrington guardians, by breaking or causing to be broken up a highway or turnpike road and entering a drain or sewer there, and abstracting therefrom certain sewage, thereby rendering the sewer useless for the abatement of nuisances. The defendant was fined 5*s.* and costs.

PREPARING PUTRID MEAT FOR SALE.

AT the Sheffield police-court, a butcher named Askew, and a farm servant named Outram, were summoned for preparing unfit meat for sale on the 7th inst. at midnight. The defendant removed almost the whole of a carcass of beef from the premises of Mr. Broxby, a farmer near Sheffield, to Askew's shop. The sanitary authorities found the meat in a putrid condition, some of it being green. Askew said he heard that it had been taken to his house without his consent, but Outram said he assisted him to remove the meat.—The prisoners were committed for three months.

THE RIGHTS OF A VESTRY OVER SEWERS.

THE committee of works of St. Pancras have had under consideration an important question relating to the right of the vestry over sewers in the parish. For some time past a contest has been carried on between the vestry and the Conservative Land Society as to the right to the sewers constructed on the estate of the society on York Rise, the society contending that as they constructed the sewers they have the right to require a contribution towards the cost from any person making a connection with them, while on the other hand the vestry contend that all such sewers are vested in them, and when Mr. Lawford constructed a sewer on the Dartmouth Park estate, which was required to be three feet nine inches, the vestry arranged with him to make it four feet six inches, they paying the difference, which sewer, as well as others, the society threatened to cut off. The vestry having passed a resolution authorising their officers to defend their rights in the event of the society proceeding to carry out their threats to cut off the connections with the sewers, a letter was read from the solicitor to the Conservative Land Society, referring to the Act 11 and 12 Vict., cap. 63, and stating: 'The position which your board assumes is different from that pursued by any board of works having connection with the society's estates. You say that the sewers are vested in the vestry; will you inform me if there be any other authority than the Act above mentioned?' The clerk informed the committee that he had written to the solicitor that the Act referred to had been repealed.

[But as the substance of it is re-enacted in the 'Public Health Act, 1875,' such a reply is not so conclusive as at first sight it looks.—ED. S.R.]

'COMMON LODGING-HOUSE.'

SIR,—Would you be kind enough to inform me what constitutes a common lodging-house in the sense in which the word is used in the Common Lodging-Houses Act?

September 21, 1875. GEORGE TWEDDELL.

[Our correspondent is not, we presume, aware of the fact that the Common Lodging-Houses Act is repealed by the 'Public Health Act, 1875,' which, however, re-enacts the leading features of the older statute. But neither statute furnishes any definition of what is a 'Common Lodging-House.' Chambers in the new edition of his *Public Health Digest*, alluding to this matter, quotes as throwing light upon the point, section 116 of the 'Towns Improvement Clauses Act, 1847,' which runs as follows:—'Every house shall be deemed a public lodging-house within the meaning of this Act in which persons are lodged for hire for a single night, or for less than a week at one time, or any part of which is let for any term less than a week.' This enactment is only legally in force in a certain number of urban districts, but probably it may be useful in assisting the settlement generally of the question 'What is a common lodging-house'?]

POWERS AS TO SEIZURE OF MEAT.

SIR,—I shall be glad to be informed on the following point.

A cow was slaughtered ten hours after calving. The fore quarters are submitted for inspection. The meat has the appearance of being perfectly healthy, and looks prime meat. Should I be justified in asking such meat to be condemned because the cow was killed after parturition?

The Public Health Act says if a carcase *appears* to the inspector to be diseased, etc.

September 21, 1875. INSPECTOR.

[We do not think that under the circumstances stated by our correspondent he would be justified in interfering with the meat.]

RURAL ACCOUNTS.

SIR,—I think it is the rule that an account for work done for a rural sanitary authority is to be sent in within six months of the date of the work being done. What I wish to ask is whether it is necessary to enforce payment also within that time, or whether the account is saved by the bill being sent in, leaving the time of payment to the good pleasure of the board? A SUBSCRIBER.

[In one sense no doubt the account is saved by being presented within the proper time, but we cannot advise our correspondent to trust to the 'good pleasure' of any board. If he does not press and successfully vindicate a claim he may be barred in its recovery almost before he knows how he stands.]

Sanitary Invention.

PERRY'S DISINFECTING PAPERS.

MESSRS. PERRY AND CO., of Red Lion Square, have invented a new and convenient system of applying carbolic acid by fixing it on paper sheets, probably by means of some essential oil. The method of using the carbolised papers is simply to pin them against the wall or to hang them over a line in the room to be purified. Messrs. Perry suggest that visitors to sick rooms could attach them conveniently to their clothing during their visits. A specially useful form to which these papers could be applied would be in the purification of foul or stuffy cupboards and closets, and to place between the sheets or mattresses on which infected patients are confined. The ready manner in which these papers can be used, and the absence of all that danger which attends the use of liquid carbolic acid, must recommend their use.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

CARTER, Mr. Stephen, has been appointed Collector to the Witham Urban Sanitary Authority, vice Lewis, resigned.

COBBAN, Alexander Richard, M.B., C.M., University of Aberdeen, Medical Officer of Health for the Kimberworth Sub-district, has been appointed also for the Rotherham Sub-district (comprising the whole) of the Rotherham Rural Sanitary District.

ELLISTON, George Sampson, M.R.C.S. England, L.S.A. London, has been appointed Certifying Factory Surgeon for Ipswich, vice Adams, resigned.

EXLEY, Mr. Joshua, has been appointed Inspector of Nuisances for the Batley Urban Sanitary District, vice Wetherill, appointed to the Selby Rural Sanitary District.

HESSLEGRAVE, Joseph, M.R.C.S. England, L.S.A. London, has been re-appointed Medical Officer of Health for the Golcar, Linthwaite, Longwood, Marsden-in-Almondbury, Marsden-in-Huddersfield, Scammonden, and Slaithwaite Urban Sanitary Districts.

LUCAS, Robert, M.D., C.M., University of Edinburgh, has been appointed Certifying Factory Surgeon for Dalkeith, vice Jefferiss, deceased.

MOODY, Mr. William, has been re-appointed Inspector of Nuisances for the Great Grimsby Urban Sanitary District, for one year.

PERKINS, Mr. Hubert B., has been appointed Assistant Surveyor to the Corporation and Urban Sanitary Authority of Reigate, vice Cross, resigned.

RICHARDS, Mr. E. M., has been appointed Surveyor to the Burslem Urban Sanitary Authority, vice Hales, deceased; 160*l.* per annum, commission of 5 per cent. on private works, and 20*l.* per annum as Surveyor to Burial Board.

RUSBY, Mr. Joseph, has been appointed Surveyor to the Nether-Thong Urban Sanitary Authority, vice Mallison, resigned.

WHITTAKER, Mr. Edmund, has been appointed Clerk to the Accrington Urban Sanitary Authority.

WOOD, Mr. A. R., has been appointed Surveyor to the Tunstall Urban Sanitary Authority, vice Hales, deceased.

VACANCIES.

BAKEWELL RURAL SANITARY DISTRICT. Medical Officer of Health for the Southern Sub-district, and the Bakewell, Matlock, North-Darley, and South-Darley Urban Sanitary Districts. Medical Officer of Health for the Northern Sub-district, and the Baslow and Bubnell Urban Sanitary Districts. Inspector of Nuisances for the Bakewell Rural (the whole), and the Baslow, Bubnell, North-Darley and South-Darley Urban Sanitary Districts. Election, 4th inst.

HASLINGDEN URBAN SANITARY DISTRICT. Medical Officer of Health, Treasurer, Inspector of Nuisances, and Surveyor.

HASLINGDEN RURAL SANITARY DISTRICT. Medical Officer of Health and Inspector of Nuisances.

MERTHYR-TYDFIL URBAN SANITARY DISTRICT. Medical Officer of Health for six months: 250*l.* per annum. Application, 5th instant, to Thomas Williams, Clerk to the Authority.

NORTHAMPTON URBAN SANITARY DISTRICT. Inspector of Nuisances: 100*l.* for one year. Application, 4th instant, to William Shoosmith, Town Clerk.

RAMSBOTTOM URBAN SANITARY AUTHORITY. Clerk and Surveyor.

SPITTLEGATE, NEAR GRANTHAM, URBAN SANITARY DISTRICT. Medical Officer of Health. Inspector of Nuisances.

ST. GILES AND ST. GEORGE, BLOOMSBURY DISTRICT. Medical Officer of Health.

WILMSLOW. Certifying Factory Surgeon.

SANITARY PATENTS.

1516. Warming and ventilating. William James Spurrier, Birmingham.

1529. Furnaces, grates, etc. Thomas Henderson, Harland Road, Birkenhead.

1572. Ventilating apparatus for ships, mines, etc. William Corfield, Clifton.

2017. Filters. John Frederick Crease, Eastney.

2653. Purifying gas. Thomas Howard, Wretton House, Norfolk.

2675. Treating sewage. John Hanson, Seville Town, Dewsbury.

2843. Illuminating gas. G. Anderson, Cannon Row, Westminster.

2715. Improvements in ventilation and in apparatus therefor. John Lanyon, Belfast, Antrim, Ireland.

2872. Improvement in apparatus for ventilating, heating, and refrigerating, for washing air gases, and other impure products from chemical and other works, also for churning and other similar purposes. John Stephens, Duke Street, Grosvenor Square, London.

2622. Earth-closets. Robert May Caffal, Alton, Hants.

1619. Water-closets. Benjamin Haigh, Cubitt Town.

1621. Cocks or valves. Benjamin Haigh, Cubitt Town.

ABSTRACTS OF SPECIFICATIONS.

711. Distributing artificial manures. D. Jacob, Maryborough.

A trough with perforated bottom, having a lateral motion imparted to it, is used. The manure is fed into the trough from a hopper.

723. Disinfecting, deodorising, disintegrating, and desiccating animal and vegetable matter. J. Cox, Great Grimsby.

According to this invention the matters or substances to be treated are agitated by peculiarly constructed knives or stirrers borne on a shaft in a closed cylinder into which deodorising agents, together with steam and hot air, are injected.

846. Stoves and flue-pipes. H. J. Kennard, Upper Thames Street, London.

This invention relates to the application to stoves and flue-pipes of internal ribs or gills exposed to the fire or hot products of combustion to absorb heat, as well as external gills for giving it off. For stoves to be used as open fires as close stoves, a blower or front is made with hooks to be hung as a trivet with an air-valve in its lower part.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer—not necessarily for publication.

A NEW ACID.

MM. A OPPENHEIM and S. Pfaff announce the discovery of a new acid named exuvitic acid, and having the formula of $C_5H_8(CH_3, OH, COOH, COOH)$. It results from the action of chloroform on acetic sodic ether.

THE ABSORPTION OF WATER BY GAS.

DR. REDNER calculates that for every cubic metre of gas recorded as having passed through a wet gas meter twenty-three litres of aqueous vapour, or two-thirds per cent., by volume of the gas so recorded, is aqueous vapour taken up by the passage of the gas through the water.

DETERMINATION OF LIME.

IN quantitative chemical analysis, a ready and excellent method frequently practised for the elimination and estimation of lime, consists in precipitating solutions of calcareous salts, even in the presence of magnesia, by an excess of ammonium oxalate and ammonia. The oxalate of lime formed is rapidly deposited, and easily washed on the filter; carrying it to a dull red heat in a platinum crucible, it is transformed into the carbonate; and the fine state of division of this renders it much more soluble in acetic acid than when it is in Iceland spar in a compact form; by employing a standard acid solution and the new re-agent violet of methylanilin the weight of the lime is determined, even without the intervening of acetic acid; the direct estimation of the alkaline carbonates by standard acid solutions is very simple, since the carbonic acid is equally without action on the violet of methylanilin.

NEEDLESS WASTE OF FUEL.

SIR JOHN HAWKSHAW, in his able and erudite presidential address at the British Association, quotes Mr. Lowthian Bell's figures to prove the enormous waste of fuel which still goes on in this country, notwithstanding the very great advances which of late years have been made towards economising the consumption of coal in our manufactories and houses. 'With the perfect mode of withdrawing and utilising the gases and the improvement in the furnaces adopted in the Cleveland district, the present make of pig iron in Cleveland is produced with three and a half million tons of coal less than would have been needed fifteen years ago; this being equivalent to a saving of 45 per cent. of the quantity formerly used. The calorific power of the waste gases from the furnaces is sufficient for raising all the steam and heating all the air the furnaces require. It has already been stated that by working steam more expansively, either in double or single engines, the consumption of fuel in improved modern engines compared with the older forms may be reduced to one-third. All these reductions still fall far short of the theoretical effect of fuel, which may be never reached. Could the reductions now attainable, and all the information already acquired be universally applied, the saving in fuel would be enormous. How many open blast furnaces still belch forth flames and gas and smoke as uselessly, and with nearly as much mischief to the surrounding neighbourhood, as the fires of Etna or Vesuvius? How many of the older and more extravagant forms of steam engines still exist? What is to be done with the intractable householder, with the domestic hearth, where, without going to German stoves, but by using Galton's grates and other improvements, everything necessary both for comfort and convenience could be as well attained with a much smaller consumption of coal; if I have pointed out that we do not avail ourselves of more than a fractional part of the useful effects of fuel, it is not that I expect we shall all at once mend our ways in this respect. Many cases of waste arise from the existence of old and obsolete machines, of bad forms of furnaces, of wasteful grates, existing in most dwelling-houses: and these are not to be remedied at once, for not everyone can afford, however desirable it might be, to cast away the old and adopt the new.

Communications have been received from:

Mr. Daniel Birkett, Carlisle; Mr. J. Bailey, Salford; Mr. John A. Davenport, Nantwich; Dr. F. Griffiths, Sheffield; Mr. J. S. Wesley, Wetherby, Yorkshire; Mr. John Spear, M.O.H., South Shields; Rev. Canon Lawson, Upton-on-Severn; Dr. D. J. Brakenridge, Edinburgh; Mr. William Lowick, Westbury-on-Trym; Mr. Francis George Heath, London; Mr. Joseph Newton, C.E., Balham; Mr. P. H. Holland, London; Dr. E. J. Sysons, Huntingdon; Mr. John M. Davenport, Nantwich; Mr. J. C. Mellis, C.E., Coventry; Dr. F. W. Grimshaw, Dublin.

EARTH TO EARTH.—The superiority of the London Necropolis (Woking Cemetery) has been specially recognised in the *Times*, and other leading journals, and it is admitted that here only can the burial of the dead be properly carried out. The Company is prepared to conduct Funerals without the intervention of the ordinary undertaker at any stage of the proceedings. Prospectus free.—Office, 2 Lancaster Place, Strand, W.C.

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Original Papers.

MODERN RESEARCHES ON ALCOHOL.

BY BATHURST WOODMAN, M.D.

II.

About the year 1820 public attention was strongly directed to the question of the toxic effects of alcohol on animals. It is true that as far back as 1679 Courter had made some experiments (see the *Philosophical Transactions* for 1712), in which he was followed by Monro, and still later by Brodie (*Philosophical Transactions*, 1811.) The experiments of Fontana, mentioned in Pereira's *Materia Medica* (article 'Alcohol') though somewhat crude, led the way to further researches. But Tiedemann and Gmelin writing in 1820 ('Ueber die Wege auf welchen Substanzen aus den Magen ins Blut gelangen') showed that the odour of alcohol could be recognised in the splenic vein, although they were unable to detect it in chyle. Dr. Cooke quotes Sir A. Carlisle, to the effect that in one case the fluid of the ventricles of the brain had the smell, taste, and inflammability of gin. And although this was contested by Dr. Christison, it was confirmed by Drs. Pereira and Ogston. Flourens' experiments on birds ('Recherches sur les Fonctions et les Propriétés du Système Nerveux dans les Animaux Vertébrés,' Paris, 1824) were made by administering alcohol to birds, after laying bare the skull. He came to the conclusion that alcohol had a special action, first on the cerebellum, and next on the cerebrum, analogous to that of a mechanical lesion. The alcohol in these cases was swallowed. Orfila (whose great work on toxicology—'Traité des Poisons; ou Toxicologie Générale'—had reached a third edition in 1827), showed that four drachms of alcohol injected into the jugular vein of a dog coagulated the blood, and produced instant death, but he also, in common with Brodie and others, stated that when introduced into the stomachs of cats, dogs, and rabbits, it produced an apoplectic condition, preceded by much excitement. Magendie, in 1823, also detected the odour of alcohol in blood. For many of these references I am indebted to Dr. Pereira's well-known work, and to other sources where they are quoted; but I now come to the important work of Dr. John Percy, published in 1839, a prize thesis entitled, 'An Experimental Inquiry concerning the Presence of Alcohol in the Ventricles of the Brain, after Poisoning by that liquid, together with some experiments illustrative of the physiological action of alcohol' [London, Edinburgh, and Nottingham, pp. 112], which is sufficiently noteworthy to deserve a considerable portion of our space. After quoting some of the cases mentioned above, and others from Dr. Ogston (*Edinburgh Medical and Surgical Journal*, vol. xl.) and Dr. Wolff (quoted by Christison), he proceeds to comment on the defects in the proofs that the fluid thus found in the ventricles of the brain were really alcoholic, the reporters having relied only on physical characters, such as taste (!), smell, and inflammability. He quotes Dr. Christison ('On Poisons,' third edit., p. 853 *et seq.*) as objecting *inter alia* 'that the statements have not been substantiated in the only way in which they admit of being substantiated, namely, by chemical analysis.' Dr. Percy then states his own process, which consists (1) in distilling the matter to be examined; (2) in adding subcarbonate of potass, and agitating; and, lastly, in examining, by chemical tests, the supernatant fluid. The tests he employed were—(1) its inflammability; (2) its power to dissolve camphor; and to these were added the physical properties previously noted, such as odour, etc. The still employed by him is figured, and is of extreme simplicity; it consists of a small matrass or globular flask, fitted with a heat tube, communicating with a test-tube. Distillation was effected by means of either an Argand lamp or a chloride of calcium bath. I am told that Dr. Anstie has objected that such an apparatus is entirely unsuitable, because it is impossible to prevent frothing. I cannot find his exact words, but Percy himself states that this is sometimes a difficulty. The author, however, knows from personal experience that, with care and attention, this may generally be prevented, so long as the operator gives his personal superintendence to the operation. A more serious objection lies in the liability to loss by evaporation and insufficient condensation in so crude a form of apparatus.

Dr. Percy's first experiment consisted in the injection, into the stomach of a large, full-grown mongrel dog, of six ounces of spirit of wine, specific gravity 850. There was almost immediate loss of voluntary power; the animal fell prostrate on one side and never afterwards moved a limb. Five minutes after fæces were evacuated, pupils contracted, respiration laborious and tongue pendulous. The pulse and respirations soon became irregular, the former sinking from eighty-four to sixty-five or less, and the respirations from twenty-six to ten, and finally to one in eleven seconds, made up of three distinct gasps. Death took place in eighty minutes. No effusion was found in the ventricles, but the brain-substance on distillation yielded a fluid burning with a blue flame, dissolving camphor, and floating on the potash solution. The fluid from the stomach yielded a similar spirit in larger quantity. On the second day, even after repeated washing, the stomach still smelt of spirit.

In his second experiment Dr. Percy diluted two ounces of the same spirit (specific gravity 850) with an equal quantity of water and introduced it into the stomach of a young mongrel bitch. As only drunkenness resulted the dose was repeated in twenty minutes' time. The first effect was to raise the pulse from 140 to 160. The pupils alternately dilated and contracted. Eight minutes afterwards the pupils were much contracted, even when the lids were nearly closed. The animal lay quite prostrate. Half an hour after the second dose the respirations were fifty per minute, and the pulse 180. Twinkling of eyelids continued. In another quarter of an hour respiration was very difficult—slightly noisy, and almost entirely abdominal. Convulsive movements of the lower limbs, which had been observed at first, gave place to convulsive action of the geniohyoid, or some other adjacent muscle. The right jugular vein was opened, and the blood found remarkably florid. No immediate effect was produced, but a poisonous dose of Scheele's acid being given, and the animal (supposed to be dead from this) being lifted up, it was found to be still alive. The dose of prussic acid was then repeated with fatal effect. There was no tetanic spasm, only slight extension of hinder extremities. An immediate section being made, the muscles were found to act on irritation by the scalpel. There was subsequent stiffening, and the blood coagulated firmly.

A very small quantity of clear liquid, a few drops only, were contained in the ventricles. The sinuses were distended *with florid blood.* Dr. Percy distilled the brain, the blood taken in life from the jugular vein, the urine, the bile, and the contents of the stomach, and in every instance, an appreciable quantity of alcohol was obtained, as proved both by the test of dissolving camphor, and that of inflammability.' To show the care with which Dr. Percy's experiments were conducted, we may mention that in his third and other experiments he even wrapped the mouth, etc., in a clean cloth, that no alcohol in the lips or from the mouth might get mixed with the contents of the cranium. In this case, an old spaniel dog had ten ounces of the same spirit, in divided doses (some of which he vomited), and this quantity proved fatal in an hour. His brain, urine, bile and the contents of the stomach were first analysed, alcohol being found in all but the urine. Two days after, the stomach, after exposure and soaking, was cut into strips, covered with water and distilled, yielding alcohol; and another portion, the next day was washed with running water, and yet yielded alcohol on distillation.

In a fourth experiment a terrier dog had seven ounces of spirit in divided doses, and was subsequently poisoned with prussic acid to hasten his (imminent) death. Not only the brain, but the liver yielded alcohol. To meet the objection that alcohol might be generated during the distillation, Dr. Percy made counter experiments on two dogs poisoned by strychnine and prussic acid respectively, testing brains and blood of each, and the bile and urine of one, in all the cases with negative results. In his fifth experiment (smaller and continued doses were given) life was prolonged, in a state of profound coma, for about twelve hours. In this case *oscillating movements of the eyeballs* were noted. The pulse varied thus: 174, 180, 150, 138, 108, 94, 76, 60, 47, 40, 36, 50, after which it could not be counted. The respirations also varied; 26, 25, 32, 22, 24, 20, 25, 19, 14, 12, were noted; it was noticed that inspiration was greatly prolonged. In this case some fluid was obtained from the left lateral ventricle, two days after death; but it had none of the physical properties of an alcoholic fluid, and an accident during distillation prevented any positive opinion being given as to its character. No trace of alcohol was obtained from the blood of the venæ cavæ and heart; but a very sensible quantity from the bile and contents of the stomach.

From dogs, Dr. Percy turned his attention to men, and proceeded to analyse the brain of a man, aged twenty-four, who died of an overdose of rum. Dr. Christison confirmed this experiment. The brain yielded alcohol (two experiments). In a second case, when death resulted from drinking, but life had been protracted for several days, and meningitis had set in, the fluid from the ventricles and the brain itself gave negative results.

Experiment six (in the dog series) is very curious. A spaniel bitch, who had recovered from a previous dose of four ounces of spirit (850 specific gravity) died instantly from two ounces three drachms of the same on repeating the experiment some time after. As rapidly as possible the brain was removed, sliced, and distilled, and a stratum of alcohol one-third of an inch in depth rapidly obtained. The blood furnished a stratum half an inch deep. In this case the heart's action ceased in about two minutes—and as the brain was removed in about ten minutes, absorption, circulation, and diffusion must all have been extremely rapid. The sudden death was probably due to the stomach having been comparatively empty. Experiment seven was negative as far as finding any alcohol in the brain, the blood, bile, and contents of the stomach, although three ounces of the same spirit had been administered to a strong bull-terrier bitch which had recently pupped, and she lived eight hours, in some suffering. The oscillatory movements of the eyeballs and contraction of the pupils were met with in this case. Dr. Percy explains not finding the alcohol by finding it to have been 'exhaled at the lungs.' The death was apparently from nervous shock and gastro-intestinal irritation. Experiment eight was also negative, partly perhaps from the vomitings which took place, partly because only the brain was examined. Experiment nine relates the injection of six drachms of alcohol (specific gravity 860) into the jugular vein of a young bull-terrier, every precaution being taken to exclude air. He died in the course of eight minutes. Alcohol was obtained from both brain and blood. Not so in the next and similar experiment, in which two injections of four drachms each of spirit of specific gravity 840, into the jugular vein were required to kill a small terrier. No alcohol was found in this case, although there was fluid in the ventricles of the brain. In experiment eleven, however, alcohol was obtained from the brain of a terrier killed by two four-drachm injections of spirit of similar strength. The same occurred in the twelfth experiment, which was of similar nature. Orfila, whose words are quoted by Dr. Percy, states in his treatise on poisons that alcohol injected into the jugular vein causes sudden death, principally by coagulating the blood. * In Dr. Percy's experiments the blood was almost invariably fluid, both in the heart and the great vessels. In the thirteenth experiment half an ounce of alcohol was injected into the left jugular vein of a young mongrel bitch, very slowly and steadily, and she perfectly recovered after paralytic symptoms. Dr. Cogswell and other experimenters met with like results. In the next two experiments alcohol was injected into the left carotid arteries of the two dogs who were the subjects of the experiment. In one case alcohol was found in the brain, but not in the others. Dr. Percy notes the alcoholic smell of the breath in many of these cases—a test now familiarly known as the policeman's! Dr. Percy tried counter experiments with water and air—in the former case recovery took place, in the latter death was imminent, but he divided the par-vagum and both recurrent nerves also. He narrates some cases where death did not result from the introduction of alcohol into the stomachs of the dogs. In these cases, however, the stomach was usually more or less full of food, and vomiting took place (experiments seventeen and eighteen in the theses are only part of those made by Dr. Percy). He sums up the result of his experiments thus: (1) That although the presence of alcohol in the fluid effused into the ventricles of the brain receives no direct confirmation from his experiments, yet the presence

* 'M. Royer-Collard a voulu voir quels seraient les effets des injections d'alcool dans les veines d'un animal, et il a constaté avec MM. Dumas et Poiseuille qui l'ont aidé dans ses recherches, une coagulation assez rapide *quand les quantités d'alcool injectées étaient considérables.*'—*Traité des Poisons*, IVième ed., tom. ii. p. 414; *Gazette des Hôpitaux*, Paris, Janvier 25, 1838. Perhaps the words in italics explain the discrepancy between Dr. Percy and the French experimenters.

of alcohol in the brain, and the rapidity with which it is conveyed thither, showing almost a proclivity or affinity for brain-matter, he considers abundantly proved. (2). *That alcohol may be detected in the blood, urine, bile and liver.* As regards the urine, he only found it once in the dog, but he found it in human urine, and his analyses even at that date were confirmed by Müller ' (Elements of Physiology,' trans. by Baly, p. 589). Magendie also (' Dictionnaire de Médecine,' tom. xii. p. 489) detected alcohol in the blood. Drs. Aitken and B. F. de Chaumont have recently examined the fluid found in the ventricles of the brain of an habitual brandy drinker, and a quantitative analysis was made by means of Geissler's vaporimeter, and in this (partly serous, partly sanguineous) effusion, 2·6 per cent. by volume, and 2·1 per cent. by weight of alcohol, were found. (' Science and Practice of Medicine,' by Dr. Aitken, vol. i. p. 770, third edition.) As regards the presence of alcohol in the blood, in urine, and other animal fluids (such as the effusion in ascites), there has been much evidence since Dr. Percy's time, and I myself have frequently found it, both in men and animals poisoned by alcohol, and in habitual drunkards dying of other diseases. As, however, this is no longer a matter of dispute, the present controversy being as to quantity rather than quality, I do not propose to prolong this paper by further evidence. In taking leave of Dr. Percy's thesis, I cannot do so without expressing my admiration, not so much for the ingenious and painstaking care, and accurate observation involved, as for the candour and ingenuousness of his mind. Hence those who believe that alcohol is in great part transformed within the living body, can find support for their views in several of his experiments. I have marked in italics some passages where he notices the peculiar florid colour of the blood and lungs seen in some of the cases; as it seems to me not improbable that, by the oxidation of the alcohol, a considerable portion of it may be converted into carbonic oxide. [$C_2H_6O + 4O = 2\,(CO) + 3\,(H_2O)$.]

ARTIFICIAL DIET OF INFANTS.

BY DR. B. F. DAWSON.

If artificial diet be judiciously selected, there is no reason why a child should not thrive as well upon this kind of nutriment as when its support is derived from the mother's breast. No food is capable of properly supporting an infant unless it possesses heat and fat-producing properties. Any nourishment which does not come up to the requirements of a liquid food having the proper quality will produce intestinal troubles. What nourishment are we to give? Is there any one kind of nourishment which uniformly and perfectly supplies the place of breast-milk? The article which most perfectly answers all the requirements, and can be trusted to furnish all the elements of nutrition in the most digestible form, is milk from some animal. The milk of various animals varies to a certain extent in the properties of its different constituents; but that from the cow is the one which should ordinarily be used, and when properly prepared may answer all purposes. In its natural state it is not a fit article of food, and some article must be added which will effect a proper dilution. Water is the article commonly added; but by far the greater number of cases suffer in consequence of its addition. The addition of water alone does not improve the digestibility of the casein, for it does not dilute it; and when milk is introduced into the stomach, diluted with water, the water is soon taken up and the casein is left as undiluted and unchanged as before the food was given. Nor does the addition of sugar make the coagula any more easy of digestion; nor does skimming the milk act beneficially, but, on the contrary, deprives it of one of its most important constituents. Inasmuch as the mother's milk contains proportionately more fat than other milk, may it not be true that the finer coagula which is formed, when the mother's milk is introduced into the stomach, is due to the presence of this fat? and would it not be better to use the milk as an article of food, from which casein has been removed, rather than use the milk which has been deprived of its cream? It had been his experience that this was the more proper course to pursue. The admixture of farinaceous articles with the milk also leads to disastrous consequences. There is one article, however, which contains such small quantities of starch that it can be used with very great success for effecting a proper dilution of cow's milk, and that is barley-water. Good cow's milk diluted from one-third to one-half with barley-water forms one of the best articles of food that can be used for infants when it is necessary to bring them up artificially. If barley cannot be obtained, oatmeal may be substituted, and answers nearly as good purpose. This article produces a real dilution of casein, and renders the coagula much finer and more nearly like the coagula which is found in milk from the mother's breast.

THE
SANITARY RECORD.
SATURDAY, OCTOBER 9, 1875.

The Social Science Congress opened on Wednesday last under the most favourable auspices. We intend giving a full report of the proceedings in our future editions, to commence next Saturday.

MEAL-TIMES.

II.

Luncheon and Afternoonch.

In healthy persons digestion is quickest in the early part of the day. So that in four hours a moderate breakfast is pretty well disposed of, and the stomach is prepared for fresh food. But a heavy repast in the middle of the working day is not only a serious interruption to business while it lasts, but leaves behind it a sense of oppression not conducive to industry. When Spain was active and prosperous the breakfast-hour was six or seven, so the next meal, four hours afterwards, received the name of ' Las Once,' or ' the 11 o'clock,' whence our word ' Lunch.' It should be a refreshment so short and so light as not to interfere seriously with the progress of the work going on, and within reasonable limits

may be held as a moveable feast, not demanding any preparation beforehand or meditation thereon afterwards. In some circumstances and occupations more than one or even more than two 'lunches' may be taken, the object being to prevent the stomach being quite empty for too long a period, though it is inconvenient to fill it completely.

By this device, the break of work in the middle of the day for dinner is avoided, and a fair day's labour got through much earlier than is usually the case; while at the same time the wearing out of the tissues, by exerting muscular and nerve-force on an empty stomach, is not risked. The machine requires carbon and hydrogen to coal its fires, and if it cannot get them by way of luncheons, it will take them from the fat and nitrogenous parts of the body.

A midday dinner has, for the industrious, the great disadvantage of usually being taken at a distance from the scene of labour, and the hurrying to it and back again from it seriously interferes with the functions of the stomach, and entails slack, careless work in the afternoon. If, to the sixty minutes actually spent away from the workshop or office, there be added the minutes employed in putting by the books or tools, and in taking them out again, the waste of material during that time in coals, steam, etc., not to mention sun-light of the highest value in many trades, and the scamping of work which is the result of indigestion, there is a loss equal in value to two hours for master and man. If this can be avoided, their daily work may be left off two hours sooner than what is (wrongly) now considered the natural termination of toil. A great saving would thus be effected in the cost of artificial light during the short days.

Luncheon is in general made too much of a formal meat to suit adults. Women view it as a festive occasion consecrated to themselves, and are inclined to visit the intrusion of a frock coat with a similar punishment, morally speaking, to that which the *celebrantes* of the Bona Dea would have inflicted upon Clodius. At all events they treat a 'lunching man' as less of a man than one who does not appear at that meal. And they are right, if hot meat, three courses, sherry or champagne, and the assiduities of a persuasive butler, are part of its essence. Experience shows that to load the stomach heavily at or near midday entails an amount of indigestion, inactivity, and loss of time and of energy for which there is no compensation. Woe to the land whose princes drink in the morning.

Observation of the evils brought about by these excesses leads many into the opposite course of abjuring luncheon altogether. In this they are wrong. Let it be kept to its original form of a mere snack, consisting of farinaceous and other vegetable food, of fruit, and a moderate quantity of dilute stimulant, and the health and temper of even the strongest will be materially benefited by it. Most people will digest it better if no meat be taken: for the gastric secretion, necessary to the solution of muscular fibre and areolar tissue, is much more apt to be interfered with by bodily and mental exertion than that of the salivary glands which dissolves starch. Just enough should be eaten as will stay the educated appetite; which will be found to stop stayed quite as long as if more were ingested; and the craving for a new supply, on its return, is of a healthier character.

Lunch is the only meal at which reading or any similar unsociable occupation should be allowed. Its informal character is thus marked out and impressed upon the mind. People should not save up an appetite; they should take a little snack as early as they feel hungry, and not mind if this spoils their lunch. Indeed, they should rather rejoice that they are freed from the temptation of making it a substantial meal.

Let it be understood that what has been said applies to adults only, and principally to adults who live a life of healthy activity. Children digest their breakfast much quicker, and require a full meal in the middle of the day. Moreover, they go to bed early, and if they eat largely a short time beforehand, the rest is apt to be broken, and the advantage of the early retirement lost. Also the stomach of young persons under puberty is larger and more muscular as compared with the rest of the body than it is after full growth. And again their work is, or ought to be, light and short and unexhaustive to the nervous system. Fortunately the youth of our island race is peculiarly impervious to artificial saturation of the mind. They may be kept in school looking at books as long as stupid tyranny chooses; but a wholesome wandering of the thoughts to other things keeps them usually from the continuous application which wears out all but complete men, and a heavy meal in the middle of which produces dyspepsia. Hence it happens that the nursery and schoolroom dinner hour suits very well all save the miracles and prodigies of premature development, who, we pray, may be always rare in England. If any special considerations induce us to work our children as hard as ourselves for a temporary purpose, let them adopt at the same time our meal-times. This should be attended to in the preparation of boys for competitive examinations.

Afternoon Tea.

May we be allowed to call afternoon tea a sort of luncheon? At all events it is designed to fulfil the same end, namely, the prevention of the exhaustion of the stomach by over-long emptiness before the convenient season for a full meal has arrived. And four or five o'clock, in households where dinner is about three hours or so afterwards, is not a bad time. If the interval be less than two and a-half to three hours, the washing away of the gastric juices by the quantity of warm liquid leaves a weakened organ for the digestion of the coming dinner, so that

hardly enough can be comfortably taken to supply the wants of the system.

We call this little refreshment a 'tea,' that popular drink being its commonest constituent. This is unfortunate, for people get to think that tea they must have, and nothing but tea, if they take a snack in the latter part of the afternoon. Whereas strong doubts must be permitted as to whether it is the material best suited to the purpose. Why should the name of the repast indicate the material at all? Why not follow the analogy of the derivation from the Spanish designation of time quoted above, and call it 'Afternoonch'? The word sounds prettier than it looks in print, and is better than the Norfolk term 'Fours' or 'Fourzes,' inasmuch as four o'clock is somewhat too early for most people. There is a time for everything, and this would seem to be the time for fresh fruits, ices, custards, curious cakes and biscuits, salads and other light greens, and all those 'meaths' and 'dulcet creams' with which Eve entertained the Archangel. Infinite fancy might be exhibited in costless modes of reintroducing the vegetable *débris* of former repasts which would otherwise find its way to the hog-trough. Ladies at home in the afternoon might vie with one another in the innumerable fashions for making cold potatoes, rice, parsnips, carrots, nay even sodden cabbage, into a pretty dish.

Did any of our readers ever, on a cold day, purchase an 'all hot' potatoe, with its inner stuffing of fresh butter, salt, and pepper, or some chestnuts hissing aromatically in the open air? And as he snatched the furtive joy, did he not vow it was a most delicious lunch, and wonder why he had never seen it in a Belgravian drawing-room?

Then, too, is the time to sip those thin, sweet specimens of bottled sunshine which the white grapes of Italy and France beget. Who can possibly relish Chateau Yquem, Frontignac, Capri, Monte Pulciano, after, or in the middle of, a heavy dinner? A whiff of their bouquet in the afternoon is better than a bumper whose delicate essence is overwhelmed by the coarse fumes of the kitchen. But beware, mine hostess, of exhibiting all these temptations at once; a novelty all by itself on each returning day will rally your friends round you much more effectually, tickle their fancies with a pleasant surprise, and avoid the pitfall of ostentation. Better to hide your light under a bushel, than to set it on the candlestick of vulgarity.

The augmentation of the weekly bills by the change here advised may be avoided in the happiest manner by the omission of the foolish display of dessert after dinner. No prudent person eats it then, and it is left to the servants or wasted. Its transportation to afternoonch would make it useful.

The substitution of elegancies for the mawkish infusion we are usually cheated with is already partly begun by the banishment from the drawing-room of the chief *raison d'être* of this tea-table. From the days of Queen Anne till lately the picturesque kettle or samovar hissed merrily by the side of the hostess, her fair hands picked the tea and put it in the pot, and her personal superintendence secured boiling water. Hogarth's little black model (see 'Harlot's Progress') would certainly have had his ears boxed if the temperature were under 212°. Now-a-days the coarse black leaves are shoved in by a kitchen-maid's fist, and sluiced with tepid greasy water. A burial in sugar and cream is the only thing that enables the mixture to be swallowed in silence.

In Holland the ladies have a pretty custom of keeping their china cups in the drawing-room, and washing up themselves, thus making it prudent to use much better china. And it may be noted, for those who are determined to have tea, that a slice of lemon and a little sugar-candy is a more harmonious and wholesome addition than milk or cream.

THE DANGERS OF CLOTHES.

The evidence tendered before the Royal Commission at Dublin, to be found upon another page, reveals a shocking state of matters in the tailoring trade as conducted there. The scene in Alton Locke, where the bridegroom died of typhus caught from infection brought in his wedding coat, would seem to indicate that the late Canon Kingsley had anticipated the revelations brought out by Royal Commission. There is no little risk in connection with the wearing of new clothes in Dublin at least, which must moderate the satisfaction usually attendant upon that experience.

It appears that not only are the hovels in which the miserable working tailors carry on their toil of the worst imaginable description, or rather bad beyond any imagination to conceive, but the commonest precautions to prevent the spread of loathsome contagious disease are neglected. It is not sufficient that the clothes are put together in stinking dens not rarely fever-stricken, but the work goes on uninterrupted by the presence of the most fatal forms of small-pox. The master tailors of Dublin must be strangely oblivious or recklessly disregardful of the facts of infection to permit clothes from such places to pass through their hands and through their premises. If they choose to run such risks themselves, possibly it is no one's business to prevent their doing so; but surely their customers ought to be protected. To don a new suit of clothes in Dublin is to incur danger of no slight description; and after these revelations we should fancy prudent persons will procure their vestments elsewhere. The facts of clothes being the media of infection are too notorious to permit of this view being regarded as at all sensational.

As to the unfortunate workers themselves, it seems that not only are they by their necessities compelled to dwell in the vilest habitations, but the system of providing them with their work is of the

worst character. Enforced idleness alternates with prolonged almost uninterrupted toil; the first half of the week the sweaters give out no work, and in the last three days the working hands have to earn their week's wages. We can realise the condition of matters during the latter half of the week, but how the first half is spent is a matter for speculation. It will scarcely be spent in self-improvement. What is the fate of the children born in these horrible dens, and what sort of men and women these creatures will develop into does not appear very definitely. The medical officer of health states that the condition of matters has led to deterioration of the race, has produced disease, with greater liability to it, and has materially injured the people who have had to exist in the above-described manner. The whole story is an outrage upon our sense of sanitation, and is discreditable to the last extreme to the employers who permit such an iniquitous state of matters to exist.

Notes of the Week.

WE have before us a valuable analysis and condensation of the Public Health Act of 1875, issued by the Local Government Board, to which we shall draw attention in a future number.

THE typhoid epidemic on the South Side, Glasgow, is still on the increase. Three deaths have occurred, and it has been estimated that about 20 per cent. of the population resident in that part of the district extending from Eglinton Street to Govan, have been attacked by the fever. Many of the cases are of a serious nature.

DRAINAGE OF MAIDSTONE.

MR. LEWIS ANGELL'S system of drainage for the town of Maidstone has been accepted. The estimate is 30,000*l.*, which will include the cost of twenty-seven miles of pipes to conduct the sewage away from the town to the filtering and clarifying works (where the lime process is used); after which the effluent will be discharged into the Medway.

SCHOOL WORK.

SIR CHARLES REED, in a masterly review of the work accomplished by the School Board of London during the past year, concluded as follows: 'Standing on the threshold of a year in which our work is not likely to be less arduous than in any of its predecessors, nothing but a high and disinterested motive can sustain the members of this board. Such a motive is, however, supplied by their common and earnest desire to train the youth of London by a sound education to habits of frugality, industry, and virtue. Looked at even from a pecuniary point of view, it is of incalculable benefit to the community that these features should be developed in the young; but those who are, like ourselves, practically acquainted with the homes of many of our children—if homes they may be called—and have contrasted the demoralising effects of such an atmosphere with the cleanliness, bright companionships, and happy influences of our schools, are able to work on with a firm conviction that such processes must tend to lift the children up to stronger manhood and purer womanhood. To hesitate in our work would be fatal to its success. Each year has brought us great results: and if we are faithful and unswerving we shall yet accomplish our cherished purpose; only let this, which is my final word, be also our motto for the future—"Nothing less than thorough will do it."'

UTILISATION OF WASTE LANDS.

THE Duke of Sutherland is taking active measures to turn the waste land on his estates to profitable account. In addition to steam and other machinery which he employs, 500 able-bodied labourers are at work, and provisions have been made for their mental and spiritual instruction. We hear, too, that Mr. Mitchell-Henry, M.P., and Mr. Twining are also largely engaged in the work of reclamation.

SPONTANEOUS COMBUSTION.

IT is only a week or two ago that we directed attention to this subject, and suggested means whereby ships engaged in coal carrying might be saved from the risk of spontaneous ignition of cargo. The newspapers of this week give emphasis to our remarks by recounting particulars of the loss of the barque *Aurelie*, coal laden, on her passage from Liverpool to La Plata, from the cause in question. The reports state that 'smoke was seen to come from the cargo, and that an iron rod passed down into the coal speedily became red-hot.' Eventually the crew, after seven days exertions in attempting to suppress the fire, escaped in the boats and left the ship to her fate. It is satisfactory to know, that although for five days the poor fellows suffered dreadful privations, they were eventually picked up, and are now well cared for at Plymouth.

Now, we have no hesitation in saying that had the *Aurelie* been fitted, before lading, with a net-work of perforated pipes throughout her hold in the manner described by us recently, the catastrophe which destroyed her would not have occurred. In point of fact the gases evolved from her cargo would have been exhausted and dissipated, whilst currents of cold air would have rushed in to supply their places. Of course there is much to be said about the stowage of coals on board ship, their varying character, bituminous, sulphurous, gaseous, or otherwise, and as to their dryness or wetness at the time of lading; but the fact remains as we have stated it, that mechanical means may easily be adopted for warding off very many of the risks to which coal ships are now exposed. The whole subject is fraught with vital interest to 'poor Jack,' to humanity at large, and is certainly of some consequence to insurance underwriters. Perhaps the last named may be the first to move in the direction of improvement, for they feel the effects of such calamities in that sensitive locality—the pocket.

BABIES.

THESE noisy parents of the race to-be would, if they could, frequently tell stories of a great amount of needless suffering which is entailed upon them by the thoughtlessness of their 'good-natured friends.' When they first wake up, it is no uncommon thing for them to have a candle flared before their eyes, to amuse them with the 'pretty red light;' then, perhaps, they are jumped, screamed or whistled at, tossed up in the air so violently that their nerves are thoroughly shaken. At other times the infants are poked in the ribs, unclean fingers are thrust into their mouths whether the poor things like it or not, or they may be tickled into spasms, or 'bo-peeped' at so vigorously as to thoroughly scare them, if it does not induce St. Vitus's dance. Should the poor, helpless victim scream, which is the only protest it can make, it is libelled by being called fractious, and perhaps dosed with soothing-syrup.

Other kind friends of the baby will, in the most thoughtless manner, kiss and hug the poor little victim, even when suffering themselves from sore throat or colds, and so entail an unknown amount of evil on the child, simply from want of the commonest thoughtfulness.

If some of these boisterous nurses and friends would remember that a very little violent excitement goes a long way with infants, they would save them much needless suffering both in their present and future health; rest and quietness are the chief things they require, and yet seldom get; especially in a large family, or where there are many

friends who take their turn to tickle and amuse the victim into a sort of hysterical spasm, and then think him or her happy. Again, in playing music to them, the most noisy and startling tunes are generally selected, to the acute torture of the sensitive tympanum, instead of those airs which are most soothing and gentle.

These are a few of many needless sufferings to which children are thoughtlessly exposed. Another very common source of torture arises from carelessness in wheeling the perambulator. In street crossing, these vehicles are more often than not allowed to bump down the full height of the kerb-stone, and then driven full tilt against the opposite kerb. Such shocks try severely the spine and nerves of the tender infants who are unfortunately consigned to the mercies of a careless nurse. We once heard of a baby who was reported to have said, 'How stupid parents are,' and if that infant prodigy should live to be a hundred it would never say a truer thing of the majority of fathers, mothers, and relatives in general.

A CIVIC DANGER.

WE have to urge a very grave charge against an ancient civic institution, and it is one which the citizens and the corporation have little power, we fear, to redress. It is, however, within the authority of the Home Secretary.

The purity of the water of Aldgate pump is a firmly rooted tradition in the minds of many of the citizens, and especially of the poorer denizens of the East End. So great a hold, indeed, has this belief, that a great many of them consider that a morning draught of spring water from Aldgate pump is a sovereign remedy for many ailments, and send for the water very religiously when they feel 'out of sorts.' There is much in the flavour and appearance of the water which explains this belief. It is clear, sparkling, and has that cool saline flavour which is so very agreeable to the palate, and which is harmless enough when the saline ingredients are not accompanied by organic taint. In this case, however, the analysis which we have had made by Professor Wanklyn, and of which we last week gave the details, shows that this cool refreshing flavour is due to the impregnation of the water with salts derived from decomposing sewage which evidently finds its way into the well, partially filtered and decomposed by the surrounding soil. The soil itself is evidently loaded with organic matter, and does not form an efficient filter; thus the water is polluted with a considerable amount of organic matter.

We may state, without going into unpleasant detail, that the water drawn from Aldgate Pump is a filthily polluted water; one which is always a source of danger, and might at any moment become a centre of infection and a means of spreading fatal disease. The most serious feature in the case is, that this water has already been examined by successive medical officers of the City of London; but the sanitary authority is, we believe, hampered in the matter by City privileges, and has no power to close the pump. It certainly, however, ought not remain in use. The Home Secretary, we believe, has the power to order it to be shut up. If it be not closed, the City sanitary authorities ought at least to placard it 'dangerous.'

THE DWELLINGS OF THE DUBLIN ARTISANS.

THE following report of a meeting of the Dublin householders will interest our readers when read in connection with our recent articles upon sanitary matters in Dublin.

A meeting of the owners of tenement house property in the city of Dublin was held, in pursuance of public notice, at No. 13, York Street last evening, for the purpose of taken into consideration the best means of protection against the arbitrary acts of the Public Health Committee. Dr. Doake occupied the chair.

Mr. William J. Russell, of Mountjoy Square, read the following resolution:—A society having been formed, entitled the 'House Proprietors or Tenement Landlords Protection Society,' for the object of legally resisting the undue, unreasonable, unequal, unfair, oppressive, arbitrary, and often illegal proceedings of the sanitary authorities, as constituted in this city, we, without in the slightest wishing or meaning to offer any factious opposition to the administration of the Sanitary Acts, provided they be carried out in accordance with the true intention of the Legislature, do hereby invite every person having any interest in the matter, to a cordial and determined co-operation by at once joining the society, and assist in making a stand against the virtual confiscation of our property, and to insist on even-handed justice, as also to consider the means of remedying many grievances which we are at present obliged to submit to, and suffer in connection with the Landlord and Tenant Act. Mr. Russell:—Have you any objection to that? Several voices:—That is what we met for. Chairman:—I think that is what the gentlemen here have met for. Mr. Russell:—I think it might even be stronger. Chairman:—We don't recognise the Dublin Sanitary Committee. Mr. O'Gorman (secretary):—In most instances it would appear as if the sanitary sergeants were the authorities, and not the magistrates. It is the sergeant, who frequently knows nothing about house property, who perhaps never had any house property himself, that must decide everything. He must know everything, and the magistrate nothing. Mr. Walter Birmingham (Anglesea Street):—Instead of wasting our time here discussing in desultory conversation the duties of the sanitary sergeant, it ought to be our object to seek legal advice as to how far we can act with respect to allowing the interference of the sanitary sergeant. We should be guided by legal advice in the matter. I adopt the paper read by Mr. Russell, and I propose it as a resolution. Mr. Kavanagh (Stephen Street):—I second it. A Voice:—It is not strong enough. The resolution was passed. Mr. Russell, at the request of the chairman, read for the meeting sec. 37, c. 93 of the Public Health Amendment (Ireland) Act, having reference to the duties of the urban sanitary authority to make due provision, when so directed by the Local Government Board, for cleansing streets, ashpits, etc., and imposing a penalty of 5s. for every day during which default continued after the expiration of a period of seven days. Chairman: We have the power of compelling them to remove these nuisances by memorial to the Local Government Board, or have them fined 5s. for every day they don't do so. That is one of the most important paragraphs in the whole Act. Mr. Kavanagh: The Sanitary Association should have authority to remove those nuisances themselves, without the landlord having to pay them, as he must at present give a guarrantee before they do so, and then have an applotment. We don't object to sanitary laws for the preservation of health, and complying with them in every reasonable way. After some further conversation it was agreed to have counsel's opinion taken as to how far the sanitary authorities were acting legally in interfering so far as they were now in the habit of doing, and a committee was appointed. The proceedings then terminated.

The activity of the Dublin Sanitary Sergeants must have undergone a wonderful development during the past summer if they have frightened the owners of the Dublin tenement houses. A similar attempt was made to start a society in the interest of tenement owners in Dublin some years ago, but we believe it collapsed. We recommend the Dublin Collector General of rates to look after Dr. Doake (we don't find the 'doctor' in the *Medical Register*) as we hear that Dublin tenement houses yield much larger revenues to their owners than houses in better parts of the city, and we think their owners might pay in proportion.

SMALL-POX IN LEEDS.

WE are indebted to Dr. Goldie, medical officer of health, Leeds, for particulars of the present small-pox attack in Leeds, referred to by the Registrar General in his weekly reports.

Leeds has had no actual epidemic of small-pox since September, 1874, which epidemic was stamped out in nineteen days. During 1875 the course of the disease has been—no case till February 1, when a simple one occurred at 10, Cambridge Street, in the north-east district; this case died in the small-pox hospital. February 22, an imported case from Keighley was the next reported; then follows another imported case from Keighley, dated May 4; this person was at once removed to the small-pox hospital, and died there.

From the above date up till July 13 no case was reported at the Health Department, when the first person attacked was a man named O'Hara, found amongst the pauper patients at the board of guardians' room. Small-pox was visible upon him then. This man had come from Milk Street, in the east district of the borough. He was at once removed to the small-pox hospital; but clearly not before he had left the germs of small-pox to flourish in Milk Street, for in a short time the disease became epidemic there. This person had come from Ireland, and entered Leeds by train from some part of Lincolnshire.

Almost all those who attended the Irish funeral of this

man began with small-pox, and so on until Milk Street, Apple Street, Windsor Street, all close to each other, became infected with the disease. It is worthy of note that O'Hara was prowling about with the infectious malady upon him on July 12 and 13; and the next case in the town was recorded on July 25, and the person attacked was the woman who kept the house in which O'Hara lodged for the night. And then followed a child of the man in charge of the disinfecting apparatus at the sanitary department. The epidemic followed on in the usual sequence of contagion until seventy-six cases were registered; the total small-pox deaths up to this day (Oct. 6) amount to eight.

Dr. Goldie mentions one other important fact in connection with this epidemic. A man named James Herring, of Apple Street, in the east district, had a child ill with small-pox; this man attended to the child during the evenings and mornings, whilst during the day he attended to his work in a large and thronged mill; the result was that he carried infection to this mill, and directly or indirectly infected thirty persons, and caused four deaths in that number. This man was proceeded against under the 126th section of the Public Health Act, 1875, and fined 5*l.* or two months' imprisonment. The death of his own child was the only means by which the sanitary officers were made aware of the disease being in his house.

It will be easily seen where the error lay, as, had it been intimated to the medical officer in the usual and most natural way, much distress could have been prevented. But from such gross carelessness this foolish man was allowed to present himself daily in the mill, proving a most dangerous and fruitful centre of infection, from whom it ramified over the whole borough.

From the generality of the cases seen, Dr. Goldie is of opinion that the type is neither confluent nor fatal. The epidemic wave is lowering fast.

ANALYSIS OF TEA BY THE CUSTOMS.

IT will be in the recollection of our readers that when the 'Sale of Food and Drugs Act' was under discussion, very strong representations were made by the grocery trade of the unfairness with which they alleged they had been treated by the public analysts in the matter of tea analysis, and a special request was made that tea should be examined in bond. That tea-dealers had experienced considerable inconvenience from the action of the public analysts we can readily believe, and the fact is confirmed by the entire disappearance from the market of certain kinds of adulterated tea which were at one time to be commonly met with.

The proposition that a duty-paying article should have its genuineness ascertained before the duty was levied was so obviously fair that it was at once acceded to, without, as far as we know, encountering opposition from any quarter.

It was, however, of course, understood that such examination would be performed by a competent staff, and in the Act itself it is laid down distinctly that the persons appointed shall be 'inspectors' to make a primary examination of 'all tea imported into and landed at any port in Great Britain and Ireland,' and '*analysts*' (the italics will be explained presently) to make a chemical analysis of all dubious or suspected samples.

This arrangement being embodied in the Act, it only remained to be seen what selection the Customs would make of inspectors and analysts, and this information was supplied by the *Times* of the 4th inst., in a paragraph copied from a paper bearing the name of the *Civil Service Review*. Of the sources of information possessed by that journal we know nothing, but presuming it to be well informed, the statement it makes is most disappointing. Whether three inspectors and two assistant inspectors are sufficient to make a preliminary examination of all the tea imported, we do not feel called upon to decide, but that a single analyst for any such sum as 50*l.* per year can perform skilfully and accurately any adequate number of tea analyses we emphatically deny.

It was, therefore, with some curiosity that we looked for the name of the gentleman who had had this new honour 'thrust upon him,' for it was difficult to believe that on such terms it could have been voluntarily sought; and, moreover, our authority informed us that the appointment 'was, of course, a foregone conclusion.'

Our curiosity was not, however, to be gratified, for though we fancied we were familiar with the names of most of the chemists who have made tea-analysis a specialty and who have written on the subject, the name of the newly appointed 'analyst' was utterly unknown to us. It is 'Mr. J. B. Keene, a gauger of the first-class.' We do not profess to know exactly what a 'gauger of the first-class' may be, but we are tolerably confident that he is not necessarily a chemist.

We, however, searched diligently the lists of the 'Chemical Society' and the 'Society of Public Analysts,' but to neither body does Mr. J. B. Keene appear to belong.

It seemed surprising that the Government should have sanctioned the appointment of any but a professional and known chemist; but in the hope of discovering that Mr. J. B. Keene joined to his position of 'gauger of the first-class' that of a distinguished chemical amateur, we ventured to institute some inquiries in reference to that gentleman.

The result of these has been, and we have sincere pleasure in stating the fact, that he is a most estimable man, a great authority on the subject of hydrometers, and an expert as to the construction of wine stills.

These are, no doubt, high qualifications, but to trace their connection with chemistry is a task which we give up in despair.

We have always given the Government credit for a sincere desire to promote the purity of articles of diet, and we have no wish to say a single unkind word about Mr. Keene, but we feel bound to ask, in the name of common sense, What does this appointment mean? As our readers are aware, the Commissioners of Customs are the appointing body, but their appointments are subject to the approval of the Treasury, and it seems incredible that the two bodies should have so stultified themselves and burlesqued the Act of Parliament. We shall be very glad to learn that our contemporary has been misinformed, but, if not, and if any sinister Mincing Lane influence has been brought to bear with the view of making the examination of tea a farce, it is just possible that those who have indulged that hope may find themselves 'hoist with their own petard,' for it must not be forgotten that the Customs' examination will not necessarily over-ride the analysis by public analysts. It is true that if a sufficient number of competent chemists had been appointed it is quite likely that their brother analysts would have been inclined to assume that the question of tea-analysis was sufficiently provided for, but the question, as far as the Customs are concerned, being at the entire mercy of a 'gauger,' the public analysts will do well still to devote a fair share of their attention to the question of tea.

The Health of Watering Places.

XVII.—BRIGHTON.

BRIGHTON is not only the largest of the English sea-side towns that have become popular as health and holiday resorts, but is on other grounds entitled to claim a foremost position among watering places. The sanitary statistics of Brighton have, therefore, a far more than local interest, more especially in the eyes of metropolitan holiday-makers. The present time, when Brighton is acting the part of a liberal host to the Social Science Association, and vital statistics are more or less under discussion in the Health Section, appears opportune to discuss the relations between

the sanitary condition and the recent mortality statistics of this watering place.

The municipal borough of Brighton, previously to its recent extension, was co-extensive with the ancient parish of Brighthelmstone, which consists of 1,462 acres. According to the census reports, the population of the parish of Brighton at the first national census in 1801, consisted of 7,339 persons, whereas it showed a marked but varying increase at each decennial enumeration, until in 1871 it was returned at 90,011. During these seventy years the increase per cent. in each of the seven decades ranged from 103·4 in the ten years 1811–21, to 14·8 between 1831 and 1841. The increase per cent. in the last three decades has been successively 40·5, 18·5, and 15·9; thus the increase of population in the borough during the thirty years ending 1871, although it has been both continuous and considerable, has showed a declining rate. Assuming that the rate of increase of population since 1871 has been maintained at the same rate which prevailed between 1861 and 1871, the population of the parish of Brighton may be estimated at 94,421 in the middle of 1874, and at 95,822 in the middle of this year.

The parliamentary borough of Brighton, which was estimated by the Registrar General to contain a population of 111,089 persons in the middle of this year, more fairly represents Brighton as a town and watering place than does the municipal borough, either past or present. It is to be regretted, both from a Local Government and a sanitary point of view, that at the recent extension of the municipal borough the new boundaries were not made to include the Improvement District of Hove, which is co-extensive with the parish of that name (it had a population of 11,277 persons in 1871), and forms an integral part of the town of Brighton, although still under local and sanitary authorities distinct from those of the municipal borough. The municipal borough, as extended, includes the parish of Preston in addition to the parish of Brighton, which formerly corresponded with the borough boundaries; if, therefore, the Hove Improvement District had also been added, the municipal and parliamentary limits of Brighton would have been assimilated. This would undoubtedly have been a desirable simplification of boundaries, and the whole of Brighton proper would then form one urban sanitary district, whereas the only way by which the whole town could now be placed under one sanitary organisation would be the formation of a combined urban sanitary district of Brighton and Hove.

The vital statistics relating to the area of the extended municipal borough of Brighton are not available for a series of years; neither are those for the parliamentary borough, which we should have preferred to take to represent Brighton as a watering place. In the following examination of the figures relating to Brighton we shall have to confine ourselves to those for the parish of Brighton, which correspond with those of the old municipal borough. There is a manifest convenience in this arrangement, as the registration district of Brighton has since 1837, when the Act for the civil registration of births and deaths first came into operation, been co-extensive with the parish and the municipal borough as recently constituted.

Following the course which we have adopted in the previous articles of this series, we will first notice the birth-rate in Brighton, partly with a view to check the estimated population of the borough which has been used for the calculation of both birth- and death-rates in years subsequent to 1871. During the ten years, 1841–50, the annual birth-rate in Brighton district and borough averaged only 27·0 per 1,000, whereas in the two succeeding decades, 1851–60 and 1861–70 it averaged 31·3 and 31·2 per 1,000 respectively; it is more than probable that the birth-rate in the first mentioned decade was understated through defective registration. During the last four years, 1871–74, the annual birth-rate in Brighton has been, successively, 30·5, 30·6, 29·9, and 28·2 per 1,000, and has thus averaged but 29·8 or 1·5 per 1,000 less than the rate which prevailed in the twenty preceding years. The number of births registered in Brighton has showed a continuous decline during the past three years; this taken in connection with a population which is estimated to increase at the rate of more than 1,300 per annum is a fact deserving notice. It may be taken as evidence that the present population of the borough is certainly not under estimated, even if it do not suggest the probability that it is somewhat over estimated. It may be noted that according to the annual report of the medical officer of health for Brighton borough, the birth-rate in 1874 was equal to 33·9 per 1,000 in St. Peter registration sub-district, whereas it did not exceed 20·3 and 18·9 in Kemp Town and Palace sub-districts. The marriage-rate in Brighton in 1874 slightly exceeded that which prevailed in the whole of England and Wales, in which the birth-rate averaged 36·1 per 1,000. The low birth-rate in Brighton appears to be due to the abnormal constitution of the population in Kemp Town and Palace registration sub-districts, which includes an unusually small proportion of married women, between the ages of fifteen and forty-five years.

The annual rate of mortality from all causes in Brighton parish, during the ten years 1841–50, averaged 21·4 per 1,000, and was equal to 22·0 per 1,000 in each of the decades 1851–60 and 1861–70. During the first four years of the current decade the death-rate in Brighton has been successively, 22·5, 20·9, 18·7, and 19·8, and has averaged 20·5 per 1,000, showing a reduction of 1·5 from the average rate in each of the two preceding decades. As the parish and registration district of Brighton are co-extensive with the Poor Law Union, no correction on account of deaths in the workhouse are necessary in the Brighton death-rate; in order, however, to arrive at the death-rate in each of the three registration sub-districts, it would be necessary to distribute these workhouse deaths according to the localities from which the deceased paupers had been admitted. We would wish to be able to exclude from the Brighton death-rate all those deaths of patients in the Sussex County Hospital who had been admitted from all those parts of the county lying outside Brighton parish. This is, however, not possible without a special local enquiry, as the deaths of municipal and ex-municipal patients are not distinguished in the death-register. It would be a valuable addition to the death-register, especially for the purpose of mortality statistics, if registrars were instructed to add in the fifth column, after the rank or occupation, the usual residence of all persons dying away from home, more especially in cases of deaths occurring in public institutions. To return, however, to Brighton, it may be stated that the annual death-rate from the seven principal zymotic diseases averaged 4·4 per 1,000 during the ten years 1851–60, and declined to 3·8 during the following decade, 1861–70. In the four years, 1871-74, this zymotic rate was equal to 4·0, 3·5, 1·9, and 2·4 per 1,000 respectively, and has thus showed a marked decline since the end of 1872. It may be noticed that small-pox and scarlet fever were epidemic in 1871; measles and scarlet fever in 1872; and that since the end of 1872, excepting a sharp outbreak of measles in the early part of 1874, the only zymotic disease which has been fatally prevalent in Brighton is whooping-cough. We shall again have reason to refer to the recently increased fatality of whooping-cough in Brighton.

Before proceeding to examine in greater detail the mortality statistics of Brighton in 1874, for the purpose of comparison with those of other English watering-places, we propose briefly to notice the principal features of the sex and age distribution of the Brighton population, especially with reference to their probable influence upon the death-rate of the borough. A thousand of the enumerated population of Brighton in 1871 contained 435 males and 565 females, against 487 and 513 respectively, in a thousand of the entire population of England and Wales. The excess of females in the Brighton population undoubtedly favourably affects the death-rate; but it is well to bear in mind that this difference in the sex proportion of the two populations only operates to the extent of ·06 per

1,000 in the annual rate of mortality, in favour of the Brighton death-rate. The average annual death-rate among males at all ages, according to the English Life Table, in a stationary population, is 25·1 per 1,000, against 23·9 among females. A thousand of the Brighton population, having regard to its sex proportion, would give a rate of 24·40 per 1,000, while that of the average English population would give 24·46. Sex disturbance alone may therefore be safely disregarded as affecting the value of death-rates for comparative purposes; but how about age distribution? The birth-rate has been so often asserted to be the controlling element of the death-rate, that it will be well to look critically at the age distribution of the Brighton population, more particularly as the birth-rate is abnormally low for a town with a population of more than 100,000, taking the Parliamentary borough to represent the town. In a theoretically stationary, or Life Table population, that is, a population in which the number of births is neither more nor less than that of the deaths, the annual rate of mortality in England and Wales among persons of all ages averages 24·47 per 1,000; this is on the assumption that the number of males and females in the population is equal. In most civilised populations, however, the births continuously exceed the deaths; hence the number of children and young adults in such populations exceed what may be called the Life Table proportions, and as a natural result the proportion of elderly persons is considerably smaller. For instance, in a Life Table or stationary population in England, each 1,000 would include 353 children and young persons under twenty years of age, whereas each 1,000 of the English population enumerated in 1871 contained 457 at these ages. On the other hand, the proportion of persons living over the age of sixty years, which would be equal to 126 per 1,000 in a Life Table population, did not exceed seventy-five in the actual English population in 1871. The excess of children under five years of age in the actual English population undoubtedly increases the rate of mortality, but this effect is more than counterbalanced by the excessive number of young persons aged between five and twenty years, when the rate of mortality is lowest, and by the very small proportion of persons aged upwards of sixty years, when the rate of mortality is still higher than among children under five years. The result is that the Life Table rates at the several groups of ages would give only 22·75 deaths each year in a 1,000 at all ages of the actual English population enumerated in 1871, instead of the 24·47 that would occur in the same number of a stationary or Life Table population at all ages. As a general rule it has been proved that in populations with low birth-rates the proportions living at the different groups of ages approach more nearly those in a stationary population, hence the normal death-rate is higher; while in the large town populations, in which high birth-rates prevail, the age distribution conduces to a normal rate below that in a stationary population or in that of England and Wales. In Brighton the normal death-rate calculated according to the English Life Table, with due allowance for the sex and age distribution of its population is 21·83 per 1,000, against 22·75 in the whole of England and Wales, and 21·69 in the aggregate population of the eighteen largest English towns. It is somewhat unusual to find that whereas the average birth-rate in Brighton is 30 per 1,000, and that in the eighteen large towns 36, the normal death-rate in each is almost identical. The normal rate in Brighton is lower than that for all England because the proportion of young children in the population is lower, and that of elderly persons shows no excess; compared with the proportions in the eighteen towns, the effect upon the death-rate of the deficiency in the number of young children in Brighton is balanced by an excess in the numbers living past the middle age, when the rate of mortality steadily advances. Space will not allow us to pursue this inquiry, but it may be mentioned that the proportion of persons living under twenty years of age in the Brighton population was almost identical in 1861 and 1871, as might be expected from the fact that the birth-rate was the same in the two decades ending with those two years; and that a decline in 1871 in the proportion of those enumerated between twenty and forty-five years of age, was balanced by an increase in the proportions both at the group 45-65 years, and among persons aged sixty-five years and upwards. The Brighton normal death-rate, calculated according to the Healthy District Life Table, with similar allowance for the sex and age distribution of the population is 16·10 per 1,000. We have, therefore, two standards by which to measure the recorded death-rate in Brighton; according to the English Life Table the annual death-rate would be 21·83, whereas calculated according to the Healthy District standard it would not exceed 16·10 per 1,000. We shall find that in recent years the Brighton death-rate has ranged between these two standards.

During the year 1874 the 1871 deaths registered within the old boundaries of the borough, namely the parish, included 976 of males, and 895 of females. These deaths were equal to a rate of 19·8 per 1,000 persons estimated to be living; to 23·8 per 1,000 of the males, and 16·8 per 1,000 of the females, living. The Brighton death-rate among persons in 1874, was two per 1,000 below the above mentioned English Life Table standard, but exceeded by 3·7 per 1,000 the standard calculated upon the Healthy Life Table, which should be the standard by which to measure the mortality in health resorts, although one which Brighton will find more difficult of attainment than other watering places on account of its large population of essentially urban character. In the sixteen other watering places previously dealt with in this series of articles, the rate of mortality in 1874 ranged from 15·3 and 15·4 per 1,000 in Eastbourne and Ramsgate, to 22·3 and 25·2 in Yarmouth and Rhyl.

The 1871 deaths in Brighton last year included one which was referred to small-pox, fifty-eight to measles, three to scarlet fever, nineteen to diphtheria, fifty to whooping-cough, thirty-three to different forms of fever, and seventy-six to diarrhœa; in all, 240 deaths resulted from these seven principal diseases of the zymotic class. These 240 zymotic or preventable deaths were equal to 12·8 per cent. of the deaths from all causes, and to an annual rate of 2·5 per 1,000 of the population. The percentage of deaths from these seven zymotic diseases to total deaths in 1874, ranged in the sixteen watering places referred to, from 5·6 and 7·6 in Eastbourne and Scarborough, to 27·7 and 28·8 in Weymouth and Yarmouth. The number of deaths from preventable disease in Brighton, and also their proportion both to population and total deaths, although showing a considerable decline from those recorded a few years since, and although comparing favourably with similar figures for most other towns of similar size, evidently affords an ample field for further sanitary progress in the town.

With regard to the zymotic death-rate in Brighton during 1874 it may be noted that the fatality from measles was confined almost exclusively to the first two quarters of the year, but resulted in considerably more deaths than any outbreak in recent years. Diphtheria was somewhat prevalent throughout the year, and the fatal cases were double those returned in any year since 1870. The fatality from whooping-cough has steadily increased in recent years; the numbers of deaths from this disease, which were seven, twenty-three, and thirty-eight in the three years 1871–73, further rose to fifty in 1874, and were sixty-seven in the first six months of this year. The thirty-three deaths referred to different forms of fevers, including typhus, enteric or typhoid, and simple fevers, showed a slight increase upon the numbers in the two preceding years, but the death-rate from this form of disease continues satisfactorily low for a large urban population. The fatality from diarrhœa, principally infantile, in 1874 corresponded with that in 1873, but showed a marked decline from the rate in 1871 or 1872; this may be taken as evidence of sanitary conditions more favourable to infant life. The annual death-rate from diarrhœa during the third or summer

quarter of 1874 was equal to 2·8 per 1,000 during the three months. The death-rate from summer diarrhœa in 1874, calculated in the same way, ranged in the sixteen other English watering places from 0·0 and 0·9 in Eastbourne and Llandudno, to 3·5 and 4·9 in Lowestoft and Margate. The one death referred to small-pox in Brighton in 1874 is the only case that has been recorded within the borough since the end of 1872. We are glad to observe that Dr. Taaffe, the medical officer of Brighton, was able to state in his annual report for 1874 the number of successful vaccinations during that year at 3,048, which exceeds the number of births registered. So long as the Brighton population continues thus to show its confidence in efficient vaccination, a few sporadic cases of the disease may occur from time to time, but a small-pox epidemic, judging from the experience of previous epidemics, is well-nigh impossible. As we shall presently see, when we consider the mortality in Brighton during 1874 at different groups of ages, the excess occurred almost exclusively during the early ages of childhood, and this is in great measure due to the fatality of measles, whooping-cough and diarrhœa. How far the mortality from these diseases is due directly to what is generally understood by sanitary condition—in in other words how correct it is to class them with 'filth diseases,' is still open to discussion. There can be no question, however, as to the fact that this mortality results from a low standard of health among the juvenile population, and it may be acknowledged that improved sanitary condition depends in great measure upon social, moral, and educational elevation, as well as upon mere scavenging and filth removal, which is but a low standpoint for sanitary effort.

The deaths referred to phthisis and to diseases of the respiratory organs in Brighton in 1874 were 257 and 329 respectively; the death-rate from phthisis was equal to 2·7, and that from diseases of the respiratory organs to 3·5 per 1,000 of the estimated population of the borough. Although the Brighton population includes at all times a considerable proportion of visitors, and a certain number of the deaths are undoubtedly those of visitors, there is not much reason to believe that any undue proportion of the visitors are suffering on arrival from either phthisis or the inflammatory diseases of the respiratory organs, such as bronchitis or pneumonia; it may therefore be presumed that the above-mentioned rates may be fairly taken to represent the mortality from these diseases among the resident population of Brighton. In eleven other watering places for which similar figures are obtainable, the death-rate from phthisis in 1874 ranged from 0·9 and 1·1 per 1,000 in Llandudno and Whitby, to 3·0 and 3·3 in Southport and Rhyl; Southport having a climate which is recommended for phthisical patients, the high phthisis death-rate in that town is probably partly due to the deaths of visitors. The death-rate from both phthisis and diseases of the respiratory organs in Brighton is considerably above the average rates in other watering places, the responsibility for which may be shared by the thoroughly urban character of much of its population, and by the cold east winds which are especially severe in Brighton during spring.

It will be useful now briefly to notice the death-rates in Brighton in 1874, among males and females, and at a few of the principal groups of ages, with a view to their comparison with the standard rates we have before alluded to. A reference to the accompanying table will render the discussion of this subject more intelligible to our readers.

We have stated that the male death-rate in 1874 was 23·8 and the female rate only 16·8 per 1,000 respectively. Compared with the standard or normal English life table rates the male rate in Brighton showed an excess of two per cent., whereas the female rate was 19 per cent. below the normal rate. Measured by the Healthy District standard the male death rate in Brighton showed an excess of 43 per cent., whereas the excess in the female rate was not more than 7 per cent. It is not only in Brighton that the reduction in the death-rate of males does not keep pace with that among females. The male death-rate relatively to that among females has steadily increased in England since the establishment of civil registration afforded the means for calculating them with an approach to accuracy. This is especially the case in urban districts, and it is a subject well worth investigation. Is it to be referred to increased wages, and the thus increased facilities for intemperance among men of the working classes? Causes affecting what is understood as sanitary condition, in the broader significance of the term, would naturally react pretty equally upon the health and death-rate of both the sexes, so it is necessary to look further for an explanation

ANNUAL DEATH-RATE IN BRIGHTON AT FIVE GROUPS OF AGES.

PERSONS.

AGES	Standard Rates		Brighton Average Annual Rates in 10 years		Rates in the year 1874 in Brighton	Deaths in Brighton in 1874 to 100 deaths in Healthy Districts
	English Life Table	Healthy District Life Table	1851 to 1860	1861 to 1870		
All Ages . .	21·8	16·1	22·0	22·0	19·8	123
0 — 5 . .	65·7	39·4	75·5	75·1	58·7	149
5 — 20 . .	7·1	5·8	6·3	5·3	3·9	67
20 — 45 . .	10·9	8·8	10·7	10·2	9·4	107
45 — 65 . .	23·3	17·0	23·2	23·8	26·4	155
65 and upwards	89·5	78·2	87·9	89·1	86·0	110

MALES.

All Ages . .	23·3	16·6	25·0	25·6	23·8	143
0 — 5 . .	70·1	42·2	81·0	82·1	60·7	144
5 — 20 . .	7·0	5·4	6·4	5·5	4·5	83
20 — 45 . .	10·8	8·4	12·6	12·7	12·5	149
45 — 65 . .	24·9	17·6	27·4	29·2	37·1	111
65 and upwards	92·4	80·0	92·8	94·6	98·0	123

FEMALES.

All Ages . .	20·7	15·7	19·7	19·3	16·8	107
0 — 5 . .	61·3	36·6	70·0	68·2	56·7	155
5 — 20 . .	7·2	6·2	6·2	5·2	3·3	53
20 — 45 . .	11·0	9·1	9·5	8·5	7·4	81
45 — 65 . .	21·8	16·4	20·2	20·0	19·0	116
65 and upwards	86·9	76·4	84·6	85·4	77·9	102

Note.—The death-rates in this Table are all annual rates to 1,000 persons living. The standard rates, according to the English and Healthy District Life Tables at all ages, are calculated with due regard to the sex and age distribution of the population of Brighton borough in 1871.

of the gradual reduction of relative vitality among males, while it is steadily increasing among females. In Brighton the male annual death-rate increased from 24·99 per 1,000 in the ten years 1851–60 to 25·61 in the decade 1861–70, while the female rate declined from 19·71 to 19·30. In manufacturing and mining populations this tendency is still more strongly marked. Space forbids our discussing the ages at which this increased death-rate among males appears most conspicuous, we may notice however, that in Brighton between 45 and 65 years the male death-rate in 1874 was nearly double the female rate.

The death-rate in Brighton among children under five years of age in 1874 was equal to 58·7 per 1,000, against 75·3, the average rate at those ages in the twenty years 1851–70; this rate was considerably below the

English Life Table rate at those ages, but exceeded the Healthy District rate at those ages by 49 per cent. Among persons aged between five and twenty years the Brighton death-rate last year was only 3·9 per 1,000, whereas it is 7·1 according to the English and 5·1 according to the Healthy District life tables. The Brighton death-rate between twenty and forty-five years was 9·4 per 1,000, against 10·9 and 8·8 according to the two life table standards. Between forty-five and sixty-five years the Brighton rate last year was 26·4 per 1,000, the English and Healthy District life tables giving 23·3 and 17·0 respectively; the Brighton rate at these ages exceeded the Healthy District rate by 55 per cent. At the last group of ages, sixty-five and upwards, the Brighton rate was 86·0 per 1,000, the English and Healthy District rates at these ages being 89·5 and 78·2 respectively; the excess in the Brighton death-rate among these elderly persons, compared with the Healthy District rate, was only equal to 10 per cent. We may notice from these figures that in order to reduce the Brighton death-rate to the Healthy District standard, the health of children under five years, and of persons aged between 45 and 65, needs the greatest improvement. Between 45 and 65 years the deaths of visitors may disturb the Brighton rates, but under five years of age this disturbing element must be almost inappreciable.

The large proportion of males and females in Brighton engaged in domestic service has an undoubted effect upon the rates of mortality in the borough between the ages of ten and thirty-five years. Seven per cent. of the male population of Brighton were returned at the census in 1871 as engaged in 'entertaining and performing personal offices for man,' against 2 per cent. in England and Wales, and 3 per cent. in London. Of the female population of Brighton, in 1871, 25 per cent. were so returned, against 12 per cent. in England and Wales, and 15 per cent. in London. The presence of a large proportion of domestic servants in a population, from various causes, invariably depresses the death-rate at the ages ten to thirty-five years.

For the sake of comparison with similar results for other watering places, we may note that the death-rate in Brighton among persons aged upwards of sixty years in 1874 was 67·7 per 1,000. In the sixteen other watering places the death-rate at these ages ranged from 56·4 and 56·6 in Weymouth and Lowestoft, to 70·9 and 79·1 in Llandudno and Rhyl.

The high rate of mortality among young children has been showed to be one of the principal causes which militate against the Brighton death-rate approaching more nearly the Healthy District rate. It will be useful, therefore, to examine in greater detail what may be called the really infant mortality in Brighton. Measured by the proportion of deaths under one year to births registered, infant mortality was equal to 164 per 1,000 both in 1871 and 1872, and to 138 and 143 respectively in 1873 and 1874. Infant mortality in Brighton may therefore be said to have declined in recent years, although it is still excessive. Infant mortality in 1874, measured in this way, averaged 151 per 1,000 in England, and in the sixteen other watering places ranged from ninety-five and ninety-eight per 1,000 in Worthing and Llandudno, to 180 and 187 in Rhyl and Southport. Illegitimacy has a marked effect upon infant mortality, and we fear that the use of the birth- and death-registers in affording information of the local distribution of illegitimate children, as a check upon baby farming and upon the wilful neglect with which these infants are often treated, is not often called into requisition. This subject of infant mortality, and especially among illegitimates, has received considerable attention in Scarborough, under the advice and direction of Dr. Taylor, its medical officer of health, and with very promising results. We recommend the subject to the attention of all sanitary authorities, and especially to the philanthropic in all large towns. Let us look at how the matter stands in Brighton. In 1874 the illegitimate births registered were 174 or 6·5 per cent. of the total births; they were in some way considerably understated in Dr. Taaffe's annual report. The Brighton death-register during the year showed the deaths of fifty-two illegitimate infants under one year, or 13·7 per cent. of all the deaths under one year, whereas the proportion of illegitimate births to total births was, as before stated, only 6·5 per cent. The rate of mortality among illegitimate infants may be calculated in a different manner. It has been stated that the proportion of deaths under one year to births registered was equal to 143 per 1,000; excluding both the illegitimate births, and the deaths of illegitimate infants, this proportion is reduced to 132 per 1,000, whereas the rate of mortality among illegitimate infants alone was so high as 299 per 1,000. There is no reason to believe that this terrible rate of mortality among illegitimate infants in Brighton during 1874 was in any way exceptional. It undoubtedly includes much indirect infanticide, and it is difficult to calculate how much moral benefit would have resulted to the erring mothers, beyond saving the lives of many innocent infants, if by some judiciously managed charitable organisation assistance had been offered to enable them to pursue their various occupations without adopting that form of putting out to nurse that degenerates into baby-farming. It may be noted that only five of the deaths of illegitimate infants registered in Brighton during 1874 occurred in the workhouse.

It is unnecessary to do more than just to allude to the mortality statistics of Brighton during the first half of this year. The rate of mortality in the parish of Brighton, corresponding with the old limits of the municipal borough, was so high as 31·4 per 1,000 in the first quarter of 1875, but declined to 18·5 in the three months ending June. The severe cold weather of the first quarter was excessively fatal in Brighton, especially among infants and elderly persons; whooping-cough, too, assumed an epidemic form and killed fifty-five children in the first, and twelve in the second quarters. The fatal cases of fever were also rather more numerous, and ten deaths were referred to scarlet fever in the six months. Full particulars of the mortality in Brighton during the first two quarters of the year will be found in Dr. Taaffe's quarterly reports.

Brighton, during 1874, showed a lower death-rate from all causes than any of the eighteen largest English towns, namely 19·8 per 1,000; the lowest rates among these eighteen towns were 20·4 in Portsmouth and 22·5 in London. The death-rate from the seven principal zymotic diseases in Brighton was 2·5, which was lower than the rate from these diseases in any of the eighteen towns except Norwich and Bristol, where it was 2·0 and 2·1 per 1,000 respectively. It is a somewhat severe test to compare the mortality of such a town as Brighton, which has over a hundred thousand inhabitants, with that of the smaller watering places, and yet, on the whole, the comparison cannot be said to be very unfavourable to Brighton. We firmly believe, however, that with a continuance of the recent intelligent activity in sanitary matters, which may easily be secured under the advice and *régime* of the present efficient medical officer of health, the death-rate may be still further reduced so as more nearly to approach the Healthy District standard. The 12·8 per cent. of deaths from the principal preventable diseases may be further lowered, and the lives of many infants spared who now fall victims to conditions, sanitary and social, unfavourable to their existence.

The periodical reports of the medical officer of health from time to time point to the many defects which a careful house to house visitation disclose in the sanitary arrangements of the houses in the borough, and unless these are promptly dealt with the improvement in the sanitary condition of the people will proceed but slowly. The intercepting sewer, which is seven miles in length, carries all the sewage of Brighton, Hove, and Cliftonville to Portobello, a point some distance beyond Rottingdean, where it is discharged into the sea. This important work, which was completed within a year or two at a total cost of little less than 200,000*l.*, will not confer its full benefit upon the town until its ventilation and means for flushing

are still further improved; until every house in the town is connected with the drainage system, and until every closet is amply supplied with water and its soil-pipe ventilated.

The water-supply of the town is in the hands of the corporation, is of good quality, and is supplied on the constant or intermittent system, at the option of the customers. It is much to be regretted that the constant system is not made compulsory, as that would remove in great measure the danger of the contamination of the water from the closet supply; and cisterns would then be no longer necessary, and all risk from their uncleanliness removed. It is to be feared that some of the town wells are still in use, which should be firmly prohibited on account of the danger arising from the cesspools which used to abound in the town, and which render all local wells liable to suspicion. With town water supplied to every house in the borough on the constant system, an important step towards further sanitary progress will have been made.

Notwithstanding the increased accommodation for infectious diseases which the County Hospital will shortly contain, and arrangements by which patients suffering from these diseases are received into the workhouse infirmary, it would be desirable that the urban sanitary authority should possess some hospital for this class of diseases under their own immediate control, situated if possible on the high ground above, and removed from the crowded parts of the town.

Lastly we would urge upon the sanitary authority special attention to the condition of the houses inhabited by the poorest of the working classes. A gradual improvement in the quality and condition of these dwellings would more than almost any other class of sanitary work tend to lower the death-rate in Brighton, and to improve the general health of its inhabitants. No one, after a thorough and critical examination of the Brighton death-register, can avoid the conclusion that this town has comparatively 'unhealthy areas,' which are a source of danger to the continuance of the improvement in the health of the town. We would venture to suggest that the medical officer of health should follow the example of Dr. Russell, of Glasgow, and divide his sanitary district into well-defined statistical divisions in order to be able to discover those parts of the town which contribute most to maintain the death-rate. We imagine that such a process would give a clue to those localities which, in the words of a recent Act of Parliament, might be described as 'unhealthy areas.'

In sanitary matters there is no such thing as standing still, and while the sanitary authority of Brighton has reason to regard with satisfaction the recently improved health of the town, there is every reason to believe that the death-rate may in various ways be further reduced, and that this favourite watering place may be in future pointed out as an actual example of the existence of a town of considerably more than 100,000 inhabitants with a death-rate but little exceeding that which prevails in the Healthy Districts of England.

Although Brighton appears late in our list of watering places, it is far the largest and practically the most important of them all. It emerged from the obscurity of being only a good-sized fishing village little more than a century ago. It is scarcely necessary to tell our readers how much Brighton is indebted, first, to Dr. Russell, the great reviver of the use of sea-water, and, secondly, to George IV. The first brought it prominently into notice as an excellent place for sea-bathing; the latter made it the most fashionable resort in England, entirely eclipsing the old glories of Bath.

Brighton differs from most other sea-side resorts in being a large populous city; and in the central portion of it the air cannot be considered to have the full purity of the sea-air possessed by smaller stations.

As the city extends for three miles along the shore, and as the eastern end is higher and lies on the chalk, and as the western end is lower and lies on clay, it is not surprising that there is a considerable variety of climate. The east end is more bracing, and the west end comparatively relaxing, while the centre and main portion of the city has a climate which may be considered intermediate between the two. It is therefore obvious that different portions of the town are suited for different classes of invalids.

The favourite Brighton season, when its climate is superior to that of many places, and especially of London, is in the end of autumn and the early part of the winter. November fogs are usually absent. Its mean winter temperature is a shade higher than that of London, and somewhat lower than that of Hastings.

In spring the east winds are frequent and strong; and Brighton, and especially its eastern end, are at that season to be avoided by those who have delicate lungs, as well as by the numerous class of those who dislike the east wind.

The air, which appears to have a magical influence on some constitutions, is not that of Brighton itself so much as that of the gently swelling elevations in the chalk, called downs. We have not mentioned downs before, not that there are not downs near other sea-side places, but we have never heard of such miraculous effects being attributed to a canter over any other downs except those of Brighton. No doubt there is a pleasant green sward, and no doubt the air of open, breezy downs is very invigorating. Still, this does not explain how not one but several of our friends have dated their recovery, from the moment when they took their first ride over the Brighton downs. Such things are hard to explain in any satisfactory way.

We turn next to the sea-bathing arrangements of Brighton.

Brighton was supplied from an early period with sea-baths, which could be taken in doors. Some of the observations of a guide-book, referring to them in early times, are amusing and are as follows:

'These artificial baths are extremely convenient. In some states of health a patient requires a warm or tepid bath to commence with, and many are able to support a plunge into a cold bath, who want nerve and strength to brave the rough embrace of Neptune. Indeed, public bathing at Brighton is exposed to some interruption as well as danger, from the heavy swell produced by the violence of some winds. At other times the beach is certainly preferable. The ladies generally resort to the water on the east side of the town, and the gentlemen to the west. Thus public decency is preserved,' says our Mentor, 'without which no society can exist.' He then proceeds to give an account of baths, on the exact nature of which we can throw no light.

'The ingenious invention of air-pump water-baths, for the relief of persons afflicted with gout or violent scorbutic affections, is secured by patent to Mr. Nathan Smith, who has found his plan attended with the most promising success.' What were these baths?

It is not necessary to say much of the modern bathing establishments. There are the public baths, and Brill's swimming and other baths, so well known to everyone, where so many have learnt to swim, and Hobden's baths, recently repaired and amplified, besides others. In short, as Brighton was the first place which supplied a variety of baths, so does it continue to offer everything that an invalid can require—vapour and shower-baths, douches and shampooing, which last is extensively practised here.

Brighton possesses a mineral water, which is situated at Wick, about half a mile west of the town. It was introduced to notice, and a small establishment was attached to it in the commencement of the present century.

The water is a chalybeate, which contains seven to eight and a half grains of solids in the pint. The chief of them are sulphate of iron, 1·6 to 1·8 grains, earthy salts three to four grains, common salts one and a half grains. It is, therefore, a tolerably strong earthy chalybeate. Unfortunately the sulphate is not a good form for iron to occur in, as it is not pleasant to the taste, nor is water impregnated with it, easy of digestion.

This particular water sometimes causes nausea, but is less likely to do so, if previously warmed. The water has been ordered in indigestion, and in cases in which chalybeates are indicated. It has at times been employed pretty extensively, we believe, but at present is not much used, in fact scarcely at all. From its constituents one would scarcely expect it to be a very satisfactory remedy.

But Brighton, for a long time, offered, and still continues to offer, a very considerable attraction in artificial imitations of a class of natural remedies in which England, on the whole, is very defective, for which reason the German Spa met with all the more acceptance with us. Struve established in the corner of a park in Kemp town, in the east end of Brighton, an elegant pump room, where you are supplied with imitations of a great many of the continental mineral waters. At one time a large number of people used to drink them every morning. Struve's waters are still a good deal used; but very few now go to drink them on the spot as they used to do in Dr. Franz's time. However, there is a good deal manufactured and sold for consumption at home.

Struve deserved all credit for his ingenious invention: but it must be remembered that the constitution of many of our waters is somewhat arbitrarily assumed. We are not perfectly certain of the exact combinations in many of them. Artificial waters may approximate closely to some of the simpler mineral waters, but cannot do so to the more complex ones. Though Struve's waters are the best of the kind, there is no doubt that many artificial waters do not really resemble the waters they are supposed to represent. But the great *raison d'être* for artificial imitations of mineral waters no longer exists, now that by Fresenius's method all mineral waters can be bottled and corked so as to remain unaltered, and now that waters can be so easily sent all over the world by railway. This remark does not apply to ordinary table-drinks and waters depending on carbonic acid. It is obvious that it will always be convenient to be able to manufacture them on the spot, and people do not leave home to drink that class of waters.

Brighton has no fewer than eight medical establishments of one kind or another, including the county hospital; and this suggests to us an inquiry into the precise nature of the hospital establishments provided at our sea-side places.

Of the class of professedly sea-bathing hospitals we have the large ones at Margate, at Rhyl, at Southport, and at Scarborough; and there is one containing thirty beds at Felixstowe, in Suffolk. Of ordinary convalescent hospitals we appear to have one at Eastbourne, one at Seaford, one at Bournemouth, and a smaller one at Dover.

Dover has also a special cottage and convalescent hospital for those who are recovering from zymotic diseases.

We have said that no class of patients benefit so much as children by sea-air; and a provision is made to a certain extent for them, when their affections are chronic and of a scrofulous nature, by such institutions as that of Margate. But it is very desirable to be able, in the heat of summer to give children recovering from more acute disorders, or from affections not of a strumous character, a change to the sea-side. This has lately been attempted in America, and sea-side homes have been provided on a small scale near Philadelphia, near New York, and near Boston. We do not, indeed, probably because we have not the same degree of summer heat, lose our children in such numbers as they do in America from diarrhœa and from cholera infantium. However, we have a sufficient mortality from infantile diarrhœa in the summer and autumn months to make more provision against it desirable. It is difficult to say how far any existing institution for children can be considered to meet this end. However, we have one or two sea-side hospitals for children. Brighton has a hospital for sick children, instituted in 1868, and St. Mary's Hospital, founded in 1855, includes an infirmary for incurables and sick children—the latter, probably, for chronic diseases only. The only other two towns which appear to offer any special assistance to children are Weymouth, with its Sanatorium, founded in 1848, with twenty-five beds, for the treatment of diseases peculiar to women and children, and Sunderland, with its hospital for sick children established in 1864.

The following information has been kindly communicated to us respecting the Brighton Hospital for Sick Children. The debt for the original building and grounds has been cleared off, but as the house is much dilapidated, there is a project for gradually building a new hospital on the freehold ground, instead of undertaking the repairs which would be necessary, and which would include almost a reconstruction of the building. In the meantime the hospital is getting on pretty well, and has about forty patients.

We shall here merely throw out the hint that more sea-side hospitals for zymotic cases, such as that of Dover, of which the want is most felt, would necessarily afford a certain amount of accommodation to children, as these diseases fall in the largest proportion on them. How has the Dover hospital for such cases answered?

We should be glad to receive information respecting the practical working of the institutions we have enumerated, and any others of the class, which we may have overlooked.

As Brighton is now within an hour and a half express of London, and is in a certain sense almost become one of its suburbs, it is almost superfluous to attempt to describe its general features.

One need scarcely say that the great characteristic and splendour of Brighton are to be found in its sea front and sea wall, which are of so great extent, and which strike foreigners with such amazement, or that the two great piers running far into the ocean, are at once ornamental and great objects of attraction to visitors. The Aquarium is a recent and most popular addition. It remains to be seen how far its popularity will be lasting, now that aquariums are starting up in all directions, a great one having been projected for Yarmouth since we wrote a notice of that place. All the recreations and amusements and institutions of large cities are to be found in Brighton, and it has always been a fashionable place.

The drawbacks to Brighton, without reference to climate, may be said to be, that it is too much of a city, that one lives in it almost in the same way as in London, and that it is nearly as expensive. There is, undoubtedly, much glare at Brighton, with absence of vegetation to refresh the eye, notwithstanding that some efforts have been made to supply it. The walks are all by the sea-side. There are scarcely any pleasant country walks to be had at all close to the town, nor is Brighton well provided with distant excursions.

Those who seek for quiet and repose, in going to the sea-side, need not resort to Brighton.

Nevertheless, to a very large number of people Brighton is the most attractive town in Great Britain.

Report.

THE FACTORIES ACT ROYAL COMMISSION IN DUBLIN.

ON September 21 and following days the Factories Act Commissioners sat in Dublin to take evidence with regard to the working of the Factories' and Workshops' Regulation Acts in that city. The mode in which the inquiry was conducted seems to have caused considerable dissatisfaction. No reasonable notice was given to those interested in the welfare of artisans, no trouble seems to have been taken to obtain evidence, and the whole inquiry was hurried over in such a manner that the evidence collected cannot be considered of much value. Excepting the evidence of Dr. Mapother about a few unhealthy trades which are carried on to but a limited extent, none of the evidence with

regard to artisans' diseases was of an exact or scientific character. Many of the important trades in Dublin were found involved, and with the exception of the poplin trade, which was only partially inquired into, there was no mention of large factories. The chief sensation of the inquiry consisted in the following evidence with regard to the 'sweating system' among the tailors.

Mr. Michael M'Mahon, secretary of the Tailors' Association, gave a dreadful account of the sweating system in Dublin, which he defined to be the sub-farming out by job operative tailors of garments to be made by families, and this system, he said, was resorted to by every tailoring establishment in Dublin, save seven, which seven the witness did not name. The regular tailors, he thought, numbered between 500 and 600 besides the sweaters—the latter taking their work home and working overtime in their own houses. He had made an inspection of some of these; about 100 in number he had himself made, by direction of the society which he represented. One of the places was so abominable that when he went home he lay for three days in bed, and feared he had taken fever out of it, the stench was so great. The yard was close to the window of the little room in which a great number of sweaters worked. There was almost no accommodation in the yard, and the place that was had been emptied complete into the yard, and instead of being removed formed a pile of the most loathsome character, into which stumps of cabbage had been inserted to grow. There was but one hall, divided between two houses. Where the people worked was a small room no bigger than the table he now sat at; certainly not more than eight feet square, and in this there were three women and a man squatted working. The whole concern was dilapidated and dirty, and had not been apparently cleaned nor washed for years. He could not say whether the people lived in this room, but the workers mostly worked in the rooms they lived in. He knew several places almost as bad as the one he had described, and knew that sickness of the worst kind often arose in them. He had reported one such case to the sanitary authorities himself, to the Public Health Committee, and also to the Sanitary Association. In that place the man and his wife and family had only one small room and a closet, and this wife lay ill of the black pox, the worst form of the small pox, and was so bad that she had to be turned in sheets, and died. Yet in that place there were three other *employés* at new clothes.

The Chairman.—You reported this to the sanitary officer?—I did, and it got no attention. Mr. Boyle, the secretary, told me first he could not interfere with people doing their business as between employer and employed. Then, by directions of Dr. Mapother, I made application again, and they told me they visited fifty-six houses in the locality—which is a wide term—but I believe nothing came of it. I very lately pointed out Lemon Street, which has a number of people working in rooms that have basement and no rear, and are in a bad state from the horrible effluvia.

Did the matter ever come before the Public Health Committee?—It did, for I saw a report in the papers of a meeting of the committee; but the Lord Mayor himself is on that committee, and so is Mr. Sykes, and both members are in the tailoring themselves, and it is hard to get men to go against their trade.

Does the sweating system go on still?—It was never so bad as it is this moment. I spoke lately to the foreman tailor of the Lord Mayor about the sort of places where their work was done, and then I went to the Lord Mayor himself, and he threatened to prosecute me for going to speak to him about it, or interfering in his business.

What did you speak to him about?—I thought I had a claim to speak to the foreman, as he had been in a place where I was employed, at the north side of the city, and I knew that a woman who carried on the sweating system was taking out a good deal of work, and that a child of my own and several other people had taken small-pox, which I attributed to the things having come from this woman's house, inasmuch as her family had all passed through the small-pox, and even one of her machinists used to work at the clothes while the pustules of the disease were out upon her hands. This woman was working for his house——

Did you make this statement to the Lord Mayor?—He would not listen to me at all.

Do many tailoring houses practise this system?—All in the city with the exception of seven, and only three of these are first-class houses. There are ninety houses in the trade, and some sweaters took work for four or five houses. Only seven houses get their work made on the premises, and not one except one gets waistcoats made at all on the premises.

Do these people work long hours?—They nearly all work night and day the last three days of the week, without any rest. This is because the work is not given out early in the week, and it must be returned before the week closes. The women work as well as the men all night, and even young children of twelve or thirteen years old are at the work. Very young children can make trowsers. I know one house which has eleven sweaters. There is no pressure to make the people who work in shops take the work home at night, but they do it. But the master sweaters give out work expressly for the purpose. A woman at the sweating business had been known—at least he heard so—to make as much as 16*s.* a week, but some made no more than 6*s.* Some of the master sweaters drew 8*l.* or 10*l.* a week, and would not pay more than 5*l.* away to the working sweaters. In fact, one man, during 'the O'Connell week,' took out and 'made' seventy-five pairs of trowsers.

The foregoing may be rather highly coloured, but we regret to state that we have personal knowledge of several of the facts mentioned by Mr. McMahon. The following day an attempt was made to contradict the statement made about the Lord Mayor's establishment (McSwiney and Co., Limited). The evidence of the foreman amounted to this, that before his time work was given out, and that during his time work was given out, to 'only one person.' This 'one person' was not shown not to be a 'sweater.' The commissioners did not take the trouble to examine the foreman's books! Possibly the commissioners could not understand a tailor's 'log book.' The foreman condemned the system of giving out work.

The following evidence of Dr. Mapother concerning the death-rate of Dublin is rather remarkable, as it is not in accordance with the official report of Dr. Burke, the medical superintendent of the General Registration Office. 'The death-rate of Dublin was moderate. It was below that of Glasgow, but above that of London.' Dr. Burke says the death-rate of Dublin is, for the whole district 26·2 per 1,000, and for the city—of which Dr. Mapother is health officer, and must be supposed to speak of—30·5 per 1,000, calculated on an average of ten years. We cannot understand how Dr. Mapother can apply the term 'moderate' to the state of the death-rate which Dr. Burke characterises as being 'for some time excessive.' Dr. Cameron's evidence, with regard to the conditions of private workshops, was the most sensible and valuable laid before the commissioners, and it is reported as follows:

Dr. Charles Cameron, one of the medical officers of the Public Health Committee, was called, and spoke of the extremely bad sanitary condition of the workshops or rooms where large numbers of people worked in Dublin. This was, he thought, worst amongst shoemakers and tailors, who hardly ever worked on Mondays, rarely on Tuesdays, and then, under the increasing burden of labour as the week advanced, began to sit up later and later until by Friday and Saturday they hardly got any rest night or day. Generally a man and his son, and one or two lodgers of the same trade, all worked in the one room, in which the atmosphere was of course extremely bad and prejudicial to health, and was made worse by the fact of the people

sleeping in the apartment, which was thus kept constantly occupied and gave the air no time to be renewed, and so it was always in a vitiated condition. This state of things was not by any means so bad in the employers' workrooms in town as in the operatives' workrooms at home; because, first of all, they did not live and sleep in such rooms, and, moreover, he found the meals were more regular in such places, and the hours of labour very much more regular indeed. He knew a case in which four men, shoemakers, lodged in a house with another shoemaker's family, which consisted of a wife and four children, with the man himself. Three of the children were girls, and the whole number worked together, and the men slept in the workroom. There were two rooms occupied by the entire community, and the cubical space was just barely that required by the Act, and so the authorities could not interfere. The girls were in that instance young, but there were abundant cases in which they were grown up, and slept under the same conditions, assisting at binding boots and at tailoring, and enjoying little or no privacy, not even in undressing. The beds such people lived in were often very bad, not unfrequently big old funereal four-posters, purchased out of some ancient house for a trifle, and furnished with curtains. It was the habit of these people, so far from admitting fresh air during the night, rigidly to exclude it from every crevice. Generally seven or eight people worked in the same room, and three or four people slept together in the four-poster beds. Altogether he must say that work was carried on under most unsanitary conditions in Dublin; and yet there would be much difficulty in interfering with the arrangements. It would never do to have some common man invested with authority to go in and visit these places at any hour he thought proper. In fact, as matters stood, the Workshops Regulation Act was practically a dead letter. The great objection he had to the present state of things in these small confined workrooms was to the irregular hours of work resulting from intemperance and the habits which it induced. If they could be prevented from working extremely late hours on Saturday and Friday they would then be forced to begin their work earlier in the week and finish it in a business manner. This idleness at the beginning of the week was, he fancied, very much, indeed chiefly, the fault of the workmen, but very much also the fault of the foremen and employers, who did not give out the work in time. He never was clearer upon any subject in his life than upon the opinion he had formed that these habits and this mode of living had materially injured the people who followed them, and had, in fact, led to a deterioration of the race, and produced disease and greater liability to it. One remedy for this would be to prevent the women and children working very late hours at the end of the week, for if the men knew that they could not fall back upon the extra labour of the women and children, they would be more careful to begin their business in time and attend to it. At the same time he was of opinion that it would be very difficult indeed to deal with the matter without making any rule laid down to include the men as well as the women and the children. Perhaps an extension of the workshops system would be, to a great extent, a remedy, that was the extension of the system of large employer's workshops for the small confined workrooms in their own houses, and to have these under proper inspectors, and insist that the work should not be carried on in the same place as the people slept and lived; and in addition to this to insist upon an increase of the cubic-space for each individual. A great cause of the people huddling together as they did was bad and insufficient food which made them more susceptible to the influence of cold. Nothing could be worse than the sanitary condition of some of those rooms, scores of which he had visited, and found great numbers of women and young persons employed in them. Taking into account the statutable definition of a workshop, and then the definition of a 'nuisance,' he agreed that the local sanitary authority seemed to have power to deal with these matters, though he would not say that it was a duty statutably so imposed upon them. Indeed he was not sure that these definitions might not reach to an author in his study (laughter). That the local authority had the power seemed clear enough, but there would be great difficulty in making it work and trying to carry it out. Speaking, however, only of sanitary conditions, and leaving out the moral and social influence, the power of the committee to act was clear enough.

Why then have proceedings not been instituted against those people who are in such a deplorable condition?

So proceedings have been often taken, but the space allowed is limited, and I would be for making, instead of 300 cubic feet, a clear space of 400 cubic feet for each individual where the people slept and worked in the same apartments and occupied them night and day, because 300 cubic feet is not enough space where the people slept and worked constantly in the one place.

Law Reports.

TENEMENTS UNFIT FOR HABITATION.

A PROSECUTION under the new Public Health Act has taken place at Saffron Walden, R. Perry, the owner of a large number of small tenements there, being summoned at the instance of the urban authority to show cause why houses which were unfit for habitation should not be repaired, and in the interim shut up.—Mr. H. Browne appeared for the prosecution, and pointed out that, under the 97th section of the new act any house deemed unfit for habitation might be shut up until put in a state of repair, and of this class of houses there were a great many in the low part of Walden. The bench made the order asked for, with costs.

SLAUGHTERHOUSE OFFENCE.

C. SEARLE, a butcher, York Road, St. Pancras, appeared before Mr. Mansfield to answer the complaint of the Vestry of St. Pancras, for that he, on August 14, being the occupier of a slaughterhouse, did keep on the premises a dog, and did not keep a sufficient number of tubs, boxes, or vessels, with tight and close-fitting covers thereto, for the purpose of carrying away all garbage, offal, and filth, and did not cause all the blood arising from the slaughtering of cattle to be put into separate tubs or vessels provided with the like materials as above, and did not cause the slaughterhouse to be thoroughly washed and cleansed three hours after the slaughtering was completed, and did not cause the inner walls to be covered with hard, smooth, impervious material to the height of four feet at least, contrary to the by-laws made by the Metropolitan Board of Works.—The defendant called Edward Curtis, a builder, who stated that he received orders from the defendant to do the walls of the slaughterhouse ten days before the inspector called, but it could not be done, as he was too busy.—Mr. Mansfield ordered the defendant to pay a fine of 3*l.* and 12*s.* 6*d.* costs.

WATER ABSTRACTED FROM PRIVATE WELLS.

SIR,—Would you kindly answer the following query in your next number?

A sanitary authority, in constructing their sewer, has caused some private wells in its vicinity to become empty; it is not evident whether the sewer has touched the spring or drained the well.

Can the owners claim compensation for their loss from either authority or contractor? the latter in his contract agreeing to make good any damage he may cause in carrying out the work. W. M. LOWICK.

[From a long series of decisions in the Courts it seems clear that the owner of abstracted water as above has a

right to compensation for the injury inflicted on him (See the cases numbered 1028 to 1058 in Chambers's *Digest*). The owner's right of action is against the local authority, but probably the local authority in the above case would be able, in turn, to establish a claim against its contractor.]

LOCAL AUTHORITIES AND GAS SUPPLY.

SIR,—Have the urban sanitary authority of a district any power with regard to the quality of gas supplied by private companies in their district? A few weeks ago the gas supplied to the inhabitants of this district was so impure that people were obliged to discontinue the use of it, and burn lamps or candles. [The general answer to this question must unfortunately be 'No,' if the gas company was constituted under a special Act, prior to the passing of the Gas Works Clauses Act, 1871; but that Act contains provisions which apply to every gas undertaking authorised by a special Act passed after the date of that Act, or by a provisional order issued under the Gas and Water Works Facilities Act, 1870, except when those provisions are expressly varied or excepted by the special Act or the provisional order. The local authority (town council, improvement commissioners, or local board, as the case may be) may, under the provisions referred to, appoint gas examiners to test the illuminating power and purity of the gas supplied; and the gas examiners are empowered to enter on the premises of the company, and examine the apparatus for those tests which the company are required to provide. If the gas supplied is of less illuminating power and of less purity than it ought to be according to the terms of the special Act, the company are liable to a penalty not exceeding 20*l*.]

Correspondence.

MILK AND INFANTILE DIARRHŒA.

(*To the Editor of the* SANITARY RECORD.)

SIR,—Will you allow me, through the medium of your important journal, to draw the attention of the medical profession and the public to what I have experienced to be a frequent element in the causation of infantile diarrhœa, which, according to a report published in the *Manchester Examiner* of to-day, is mentioned as the chief cause in the mortality of the innocents which has assumed gigantic proportions in the town and district of Wigan, at the present time?

I allude to the use of milk in its raw state.

Not to mention the evils which may result from the milk of cows in an impaired state of health, whose symptoms of ailment may not have developed sufficiently to excite the suspicion of their attendants; nor to speak of the purgative effect on the child when the diet of this useful animal consists largely of turnips; the recent sloppy, changeable weather will, I presume, be sufficient to account for some derangement of the secretions of milch cows exposed to its influence, as well as to answer for the full complement of this autumnal scourge on the delicate constitution of the infant—too often insufficiently or injudiciously clad, and unduly exposed to the outer air.

To think of the substitution of any other article of food in the place of milk, is out of the question, knowing how essential it is to infant life and more advanced growth; but much of the tendency to diarrhœa which its use in its raw state seems to favour—except, perhaps in fine summer weather, may be averted by simply boiling it, which I should recommend to be invariably done when first procured. Cases of infantile diarrhœa which have resisted medical means, and some cases of a dysenteric nature, have subsided when this precaution has been taken.

The use of a flannel binder round the bowels should not be overlooked.

Oct. 4, 1875. JOHN WARD, M.D.

Review.

A Digest of the Law relating to Public Health and Local Government. By G. F. CHAMBERS, of the Inner Temple, Barrister-at-Law. (Knight, Fleet Street.)

WE take it that this book is by no means intended to be a heavy and repulsive treatise for the use of lawyers only, nor is it such. On the contrary, the author seems to have sought to cater quite as much for non-legal as for legal readers, and therefore he may claim for his book that it is calculated to be of general usefulness to everybody. No medical officer of health or inspector of nuisances can expect to perform his duties with satisfaction to himself or his employers unless he possesses at least a general acquaintance with the outlines of public health law. For such officials, therefore, Mr. Chambers's work is particularly well fitted. It comprises five parts, respectively designated (1) 'Digest of Statutes;' (2) 'Digest of Cases;' (3) 'Various Official Documents'; (4) 'Precedents of By-Law;' and (5) 'The Statutes.' Parts 1 and 2 are the real back-bone of the book, and the information given therein will be found to differ from all the books on public health law hitherto published. The 'Digest of Statutes' is a condensed analysis of the whole body of public health law broken up into about 800 paragraphs, conveniently sorted out under different heads. In the 'Digest of Cases' the author has applied the same principles of classification as near as might be to some 1,100 cases decided in the Superior Courts, and relating to local government in the largest sense of the term. The general effect is that the reader has exhibited to him all the cases on the several subjects dealt with, and can readily compare one decision with another, and learns in reference to any circumstances which have arisen in his own locality, whether the particular point or any one analogous to it has ever before been considered by any legal tribunal. The following may be cited as illustrations of the ways in which the author exhibits his 'digest' of cases:—

By-Laws.

(1) BUILDING.

1872. [95]

Adams v. *Bromley L. B.* 'Local Government Act 1858,' sec. 34—By-Law as to open space—Dwarf fence held to be an 'Erection' infringing the by-law. (37 J.P., 662.)

1863. [96]

Anderton v. *Birkenhead.* By-Laws—Breadth of open space in rear of a building to be everywhere at least the minimum specified. (32 L. J., M. C., 137: [*Anderton* v. *Rigby*] 13 C. B. (N.S.), 603.)

Part 3 contains several official papers issued by the Local Government Board which sanitary officials will occasionally have need to refer to. The selection of statutes is more than usually full, and the arrangements being scrupulously chronological is very convenient for purposes of reference. The indexes might be improved, but, barring this, Mr. Chambers has produced a book which can scarcely fail to have a large and rapid sale, especially in view of its moderate price.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

ALCOCK, John, M.R.C.S. Eng., L.M., L.S.A. Lond., has been appointed Medical Officer of Health for the Burslem Urban Sanitary District, vice Goddard, resigned: 50*l*. per annum, to commence with.

ALTY, Mr. Henry, has been appointed Surveyor to the Corporation and Urban Sanitary Authority of Barrow-in-Furness.

BOWMAKER, Mr. William, has been appointed Surveyor, Inspector of Nuisances, and Collector, to the Houghton-le-Spring Urban Sanitary District.

CLARK, Mr. E. B. Ellice, has been appointed Surveyor to the Corporation and the Urban Sanitary Authority, Derby, vice Thompson and Hume, resigned: 500*l.* per annum, office accommodation, and the services of a Clerk.

DUNSTAN, Robert, M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the St. Ives, Cornwall, Urban Sanitary District.

FULSHAW, Ralph, M.R.C.S. Eng., L.S.A. Lond., has been appointed Certifying Factory Surgeon for Earl-Shilton, Leicestershire, vice Spencer, deceased.

HAY, Mr. James, has been appointed Inspector of Nuisances for the Hexham Urban Sanitary District, vice Forrester, resigned.

HOPKINSON, Mr. William, has been appointed Surveyor to the Ripley Urban Sanitary Authority, vice Walters, deceased.

HORNSBY, James, Esq., has been appointed Chairman of the Spittlegate Urban Sanitary Authority.

LANGSTON, Mr. James, has been appointed Surveyor and Collector to the Spittlegate Urban Sanitary Authority.

LYNE, Mr. Thomas, jun., has been appointed Clerk to the Spittlegate Urban Sanitary Authority.

MORRISON, Mr. Hector, has been appointed Inspector of Nuisances for the Banbury Rural Sanitary District, vice Austin, resigned: 150*l.* per annum.

NEWBY, Thomas, M.D. Univ. St. And., M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Great Grimsby Urban Sanitary District for one year.

PARKER, Major Charles J. B., has been appointed Treasurer of the Spittlegate Urban Sanitary Authority.

SHANNON, Mr. Simon, has been appointed Inspector of Nuisances for the Fleetwood Urban Sanitary District, vice Willacy, resigned.

SIGGERS, Mr. Henry, has been appointed Assistant Surveyor to the Corporation and Urban Sanitary Authority of Bury St. Edmunds: 150*l.* per annum.

WHEAR, Mr. N. C., has been re-appointed Inspector of Nuisances for the Penzance Port Sanitary District.

VACANCIES.

BEDLINGTONSHIRE URBAN SANITARY DISTRICT. Surveyor and Inspector of Nuisances: 150*l.* per annum. Collector: 100*l.* per annum. Applications, 20th instant, to George Jeffrey, Clerk to the Authority, Morpeth.

BURSLEM. Certifying Factory Surgeon.

HASLINGDEN RURAL SANITARY DISTRICT. Medical Officer of Health and Inspector of Nuisances.

KEIGHLEY URBAN SANITARY DISTRICT. Surveyor.

RAMSBOTTOM URBAN SANITARY DISTRICT. Clerk and Surveyor.

RAMSGATE URBAN SANITARY DISTRICT. Surveyor and Inspector of Nuisances.

ROYSTON RURAL SANITARY DISTRICT. Inspector of Nuisances: 80*l.* per annum. Application, 12th instant, to Henry Thurnall, Clerk to the Authority.

SLIGO URBAN SANITARY DISTRICT. Medical Officer of Health.

ST. GILES-IN-THE-FIELDS AND ST. GEORGE, BLOOMSBURY, DISTRICT. Medical Officer of Health.

SANITARY PATENTS.

2411. Respirators. Hewley Charles Wordsworth, Sloane Street, Knightsbridge, London.

2859. Improvements in the manufacture of coffins. Frederic Pelham Warren, Southsea, Hants.

2898. Improvements in methods of and apparatus for washing clothes, linen, or other fabrics. Charles Autier, Paris.—A communication from Edmund Dubuc and Victor Mutel, Paris.

2928. Improvements in the methods of and apparatus for carbonising organic matters and for treating night-soil to obtain useful products therefrom, such improvements being partly applicable to other purposes. James Robey, Manchester.

2932. Improvements relating to the lids or covers of chamber utensils, night-commodes, water-closets, seats, and the like, for preventing the escape of effluvia. Steven Dixon, Nottingham.

ABSTRACTS OF SPECIFICATIONS.

916. Ventilating mines. W. Knot and T. Rudd, Wigan.

This invention consists in placing the wings of ventilating fans at an angle to the axis instead of parallel thereto as now usual, also in making the casing of such fans of cast or wrought iron instead of brickwork, also in varying the discharge orifice by means of a pair of plates hinged together and moved to and fro in the flue, also in the use of one or more stationary plates that are put into the flue at various distances from the sides to reduce the discharge orifice, also in driving the said fans by means of steam engines set diagonally on the frame supporting the fan shaft.

934. Earth closets. W. Liddiard, Wantage.

The improvements consist in mounting a measuring barrel at the bottom of the hopper, into a cavity in which a portion of the deodorising material is received, and discharged by means of the pull handle into a spout leading to the closet pan.

984. Water-closets. W. Phillips, Sheffield.

This provisional specification describes means for producing a more effectual flushing and cleansing of the basin or pan of closets. This is effected by a pipe or channel formed all round the top of the basin by a 'fan' or distributor fitted at the front as well as at the back, and by openings on the underside of the channel between the two fans.

OPEN CONTRACTS FOR SANITARY WORK.

THE Newport and Pillgwenlly Water Works Company require 12,000 tons cast iron pipes, 15 inches diameter. Specifications and forms of tender to be had from Mr. John Taylor, 27 Great George Street, S.W.

The Metropolitan Board of Works are open to receive tenders up to the 15th inst. for the supply of material and execution of work in respect to the measured work of the main drainage and other sewers. Specifications and details, price 5*s.* each, to be had of Sir J. W. Bazalgette, at the office, Spring Gardens, S.W.

The St. Pancras Guardians require dining rooms, kitchen, bakery, and laundry to be erected. Specifications and details at Mr. H. H. Bridgeman's, the architect's office, price 21*s.* Tenders to be delivered to the Clerk not later than the 14th inst.

The Canterbury Bath Company require tenders for the construction of a new swimming bath. Plans and specifications at Mr. John Green, the architect's office, 8 St. Margaret Street, Canterbury. Tenders must be sent by the 19th inst.

The Douglas Aquarium and Baths Company require tenders for the substructure of baths. Specifications, etc., price 21*s.*, of Mr. Pons, architect, 41 John Dalton Street, Manchester, or of Messrs. Speakman & Hickson, architects, 23 St. Anne's Street, Manchester.

The Hastings and St. Leonard's Aquarium and Baths Company require tenders for the erection of the buildings. Specifications and details can be seen at Messrs. Jeffrey, Skiller & Co., 96, Great Russell Street, Bloomsbury, and 5, Havelock Road, Hastings. Tenders not later than the 18th inst., to the Secretary, 23, Havelock Road, Hastings.

The Evesham Town Council and Sanitary Authority require tenders for the construction of pipe sewers, sewage tanks, turbine house, man-holes, ventilators, etc., and for the drainage of the town. Drawings, specifications, etc., at Messrs. Gotto & Beesley's. Tenders to Mr. Thomas Cox, Town Clerk, Evesham, by the 16th instant.

The Ilkley Authorities require tenders for the construction of the main outfall sewer. Particulars of Mr. E. Filliter, 16, East Parade, Leeds. Last day, October 11.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer—not necessarily for publication.

DISINFECTANTS.

AFTER an exhaustive series of practical tests of the various disinfectants sold in New York, embracing over fifty kinds, Professor Elwin Waller, of Columbia College, concludes that the best disinfectant is carbolic acid. About 1 per cent. of the mixture should consist of carbolic acid. For prompt disinfection which is only temporary, strong oxidising agents, such as chlorine, potash, permanganate, nitric acid, etc., should be used. Of these, the cheapest and most available is chloride of lime.

SOILS AND MANURES.

RECENT experiments of MM. Boussingault and Schloesing, says the *Scientific American*, are of considerable importance with reference to the theories of fertilisation of soils and the utilisation of manures, since they bring to light a number of interesting facts, which are summarised in the following conclusions:—(1) Arable earth does not become nitrified at the expense of the nitrogen gas in the atmosphere. Agriculture has nothing to expect from that source which will tend to the profit of the crops. (2) The theory of a nitrification resulting from the combination of nitrogen gas and oxygen, in the presence of matters rich in hydrogen and carbon, according to the experiments above noted, is no longer sustainable. (3) The source of nitrogen of nitrates formed in the soil should be considered, in the absence of positive proof to the contrary, as reposing only in the nitrified organic matters combined with the mineral elements of the soil. (4) Nitrates in decomposing in the soil, under the influence of a reducing atmosphere, yield but a small fraction of their nitrogen, under the form of ammonia retained by the earth by virtue of its absorbing power. The balance of the nitrogen of the nitric acid returns to a gaseous state, and thus becomes lost to the crops.

EARTH TO EARTH.—The superiority of the London Necropolis (Woking Cemetery) has been specially recognised in the *Times*, and other leading journals, and it is admitted that here only can the burial of the dead be properly carried out. The Company is prepared to conduct Funerals without the intervention of the ordinary undertaker at any stage of the proceedings. Prospectus free.—Office, 2 Lancaster Place, Strand, W.C.

NOTICE.

THE SANITARY RECORD *is published every Saturday morning, and may be ordered direct from the Publishers. Annual Subscription, 17s. 4d.; free by post, 19s. 6d.*

Reading Covers to hold 12 numbers of THE SANITARY RECORD *have been prepared, and may be had direct from the Publishers or through any Bookseller, price 3s. each.*

Social Science Congress.

MEETING AT BRIGHTON, 1875.

HEALTH SECTION.

RECENT PUBLIC HEALTH LEGISLATION REVIEWED, WITH THOUGHTS AS TO FUTURE LEGISLATION.

BY G. F. CHAMBERS, of the Inner Temple, Barrister-at-Law. Author of *A Digest of Public Health Law.*

I HAVE proposed to myself the task of bringing under your notice the matters covered by this title, rather because I thought it would be of real practical usefulness to do so, than because I anticipated exciting your attention by anything calculated to kindle enthusiasm, or deserve in any special degree the patient attention of this important audience.

The session of 1875 was opened on the understanding that it should be devoted to social and useful topics rather than to mere party politics, and the anticipations of sanitary reformers cannot be said to have failed of realisation.

What I propose to do now is simply this: to compare the present sanitary situation so far as the law is concerned with the past; to point out generally the nature of the changes made, and, if time permits, to offer a few observations on the things which it will be desirable that Parliament should do for us hereafter. Naturally, I must devote the chief part of my time to the new consolidated 'Public Health Act,' but I am not without hopes of being able to find means for directing a small portion of your attention to other legislative proposals besides the one just alluded to.

Confused State of the Old Law.

It would be an utter waste of time for me to adduce one single proof of the frightful confusion which has prevailed for some years past in the state of our Public Health Law; it is scarcely even worth while to mention the fact that everybody agreed years ago that little real progress would ever be made until one, two, or three dozen (to deal with the chief) Sanitary Acts were amalgamated into one. The necessities of the case were for the first time well brought out by the Royal Sanitary Commission of 1869, which commission originated a first-rate bill in 1871. A second and improved edition was brought forward in 1872, in each case by a man to whom we owe more than many of us are aware of—Sir Charles Adderley, M.P.

The times, however, were unpropitious. The Local Government Board had not a statesman of large ideas at its head, and not till 1875 did good work commence in good earnest. No sooner was an earnest man placed in command, than a good consolidation bill was brought forward, and passed; and a start has been made which promises to initiate a series of parliamentary triumphs for sanitary reformers.

Complaint is made that the new Act is defective in numerous particulars; I do not for a moment assert the contrary, but I do say that the advantages of having nearly all our public health law in one Act instead of in twenty are incalculable. Making a little allowance for the magnitude and tediousness of the task which the draughtsmen had to perform, I think it may be said of the new Act that its 341 sections are fairly consistent throughout. This alone is no small gain, for the contradictions which existed in the old state of things were alike a scandal, and fatal to the due administration of the law, and made it exceedingly difficult even for lawyers to expound and summarise the law, as I found to my cost at every turn in writing my book on Public Health Law.

Deficiencies of the New Act.

Two principal complaints may be brought against the new Act.

1. That it is put together in a very unmethodical and haphazard form; and 2. That it is very defective by reason of the trifling nature of the amendments which it makes.

Both these complaints are, no doubt, in a measure well founded. The eleven main divisions of the Act follow one another by no means in an orderly or natural sequence. For instance, having stated what are to be the authorities to execute the Act, one would certainly have anticipated that the machinery for electing those authorities would have followed in immediate succession. But it is not so. We jump forthwith (at section 13) into sewers and drains; and the election arrangements which obviously are among the very first things to demand attention when we are proposing to form a local board are lumped together at the very end of the Act in the inconvenient shape of a series of schedules, the numbers and sub-numbers and sub-sub-numbers of which are most puzzling, to say the least of it.

As regards the complaint that the amendments are so few—in the first place they are much more numerous than most of the critics are aware of; and secondly, Mr. Sclater Booth was, in my opinion, very wise in refusing to allow either his bill or himself in the conduct of it to run the risk of being swamped by accepting numerous amendments, many of which Parliament assuredly would not yet have accepted, because as yet insufficiently impressed with the claims of sanitary science.

It would be an exceedingly easy matter to string together a long chain of alterations in the law, every one of which would be most desirable, but of many of which it may confidently be affirmed that public opinion is not ripe for them, however much the doctors and the lawyers may press for them.

Having thus reviewed the 'Public Health Act' as a whole, it may be well to point out more specifically some of the changes which have been made.

Many features of the old law which by accident rather than by design were restricted to urban districts have now been made applicable to rural districts. Amongst these may be noted power to purchase sewers; power to enforce the whitewashing of houses certified to be so filthy as to endanger health; power to require certain useful additions to be made to factories in rural districts.

The general additions to, and alterations of, the law, if anything like a complete list were made, would really be found very numerous and far from insignificant.

I think it will be useful to enumerate a certain number of these changes even at the risk of wearying you; for few things are more difficult than to discover precisely what are the changes introduced into a revised Act of Parliament when the language of the new Act is almost identical with the old one, though not quite so.

Alterations Made.

I will run through some of the changes in the fewest possible words.

Land may be let for sewage utilisation purposes for twenty-one years instead of seven years.

The additional water-supply powers are numerous and important. The limited powers of the Public Health Act, 1848, are superseded and replaced by the more complete and better framed powers of the General Water Works Acts. In connection with water-supply, one very important change has been made. Under the old law a compulsory supply could only be enforced on an owner when the supply was obtainable by a payment limited to 2*d.* a week. This limitation was, in practice, usually found to defeat the whole enactment. Accordingly, the Local Government Board is now empowered to enlarge the limit, that is to say, to enforce the supply of water, even where more than 2*d.* a week will have to be paid for the supply. I need hardly point out what a strong and important screw this will enable local authorities to put upon the owners of cottage property, and I am sure you will join with me in hoping that they will do so.

The long standing, and I would add very surprising, doubt as to the meaning of the 'overcrowding' provision of the Sanitary Act, 1866, is removed; that is to say, the offence of overcrowding will henceforth be complete, irrespective of any subterfuges as to whether the inmates belong to one or to more than one family.

Whilst the hospital provisions have not undergone the extension which some of us would have wished, in the direction of increased powers to compel the establishment of infectious hospitals, yet an encouragement to the principle of isolation will be found in the section enabling a local authority to recover costs incurred by them in maintaining in a hospital a patient who is not a pauper. The power conferred on the Local Government Board, to compel the establishment of mortuaries, cannot fail in many urban districts of large size to be of most salutary usefulness.

The buying-up powers of urban authorities have been greatly extended by the new Act. In the first two cases with, and in the third (probably by an oversight) without, the sanction of the Local Government Board, any urban authority can enter into arrangements to purchase gas works, markets, and water works.

And, independent of this, facilities are granted to urban authorities to contract for the supply of gas free of the old three-years limit, and even to make and sell gas under the Gas and Water Works Facilities Act, 1870. All these additional powers which have just been alluded to will in their way encourage the principle for which I have always been a strong advocate—the transfer generally of works of gas and water-supply from private companies to public authorities.

Whilst large questions have received attention, small ones calculated to promote improvements in the externals of our towns have not been neglected. Urban authorities are empowered to make by-laws for the regulation of public walks and pleasure-grounds belonging to them; and provision is made for the protection of trees in streets by affixing a penalty of 5*l.* to the wilful injury of them, in addition to liability on the offender to make compensation for the mischief he may do.

Some alterations are made in the law regulating medical officers of health, which will, probably, not be acceptable either to many of those officers or to the authorities appointing them. I pass over some useful provisions respecting joint appointments of such officers and business details connected with the arrangements, to note that henceforth all medical officers of health appointed under the Public Health Act will come under the control of the Local Government Board, whether the appointing authorities do or do not accept contributions from the central authority in respect of the salaries of such officers. This meets what I can well believe may have proved a substantial grievance (from the standpoint of the sanitary reformer, that is), viz. that certain local authorities have intended to render merely a sham compliance with the Act of 1872 by appointing an officer on the understanding that he was to do nothing, a state of things which the Local Government Board has hitherto been powerless to interfere with, because paying nothing towards his salary; all assistance being refused in order to evade all control. This abuse will now cease, because the Local Government Board will be able to control, whether contributing or not contributing to a salary.

Building by-laws may now embrace regulations with respect to the chimneys of new buildings as well as the walls, foundations and roofs thereof. It needs not to be pointed out how often it will conduce to the protection of life and property during storms that chimneys should have been erected under competent supervision instead of in defiance of the commonest principles of natural philosophy.

Enlarged powers of entry for the examination of lands and premises are conferred; that is to say, the daily limits are no longer 10 A.M. to 4 P.M., but 9 A.M. to 6 P.M., an extension of time which a town surveyor will often find very conducive to the proper performance of his duties.

These latter observations of mine, and they might with ease have been greatly extended, will serve to justify a remark which I made at an earlier stage, that the Public Health Act, 1875, cannot justly be reviled as merely a feeble measure of consolidation with scarcely a new idea in it. On the contrary, it seems to me that Mr. Sclater Booth has given us in addition to the old matter which was good by no means an insignificant amount of new matter, which I am persuaded will also prove to be good and useful, and certainly it may be affirmed with truth that he has grappled with a stupendous and most troublesome task in a large and liberal spirit, which stands in striking contrast with the wretched efforts of his predecessor in office, Mr. Stansfeld.

Omitting, therefore, all allusions to such Acts as the Artisans and Labourers Dwelling Act, the Sale of Food and Drugs Act, the Local Authorities Loans Act, and the Public Works Loans Consolidation Act (all measures of first-rate usefulness and importance), I will take leave to submit a few suggestive observations with respect to future public health legislation.

Suggestions for the Future.

I mention first, in order to get rid of it (though really by no means a matter unworthy of attention), the desirability that, in the next new edition of consolidated public health law, some attention should be paid to the orderly arrangement, in convenient sequence, of the various subjects handled.

Sir C. Adderley's bill of 1871 furnishes some

useful suggestions, not only as to this, but as to some of the points I am now going to raise.

One of the Acts proposed to be consolidated in 1871 was the Towns Improvement Clauses Act, 1847. The reasons in favour of this, in my judgment, still stand good. This Act touches at many points the Public Health Act; much of its matter is incorporated into that Act; much is altogether superseded by that Act; yet it remains on the Statute Book as a distinct body of law.

The same remarks apply, with little alteration, to the Towns Police Clauses Act, 1847. It would be very desirable to embody this in a future revised edition of the Public Health Act, 1875, and I do not think the difficulties to be got over are very serious. If this Act were touched, advantage should be taken to enlarge the list of prohibitions in section 28. For instance, the practice (a very common one) of washing down, with brushes and buckets of water, the fronts of houses abutting on streets in large towns might, with great benefit to foot-passengers, be put under restriction as to hours. Operations of this sort may frequently be noticed in progress at hours when streets are crowded, and a genuine nuisance is the result.

Some alterations in certain of the pecuniary qualifications attaching to individuals under the present law are needed. These qualifications are not only very arbitrary (it is inevitable that they should be arbitrary) but objectionable *per se*. For instance, the rating qualification of members of local boards is 15*l*. in districts under 20,000 population, and 30*l*. over 20,000 population—a distinction which is as irrational as the figures (especially the 15*l*.) are insufficient.

A local authority may refuse to register a common lodging-house unless the applicant produces a certificate of character signed by householders of the rateable value of at least 6*l*. each. I leave you to judge of the value of such a certificate, though probably in many cases it would not be signed at all: it would be a case of 'John Jones, his mark.'

I cannot refrain from expressing great doubt whether it will be possible to maintain the election arrangements of the new Act; for the authors of the Act have made local board elections synchronous with poor law elections, forgetful, apparently, that both often require the same books and parish officers, who would, therefore, have to be in two different places at one and the same time.

THE RESULTS OF THE PUBLIC HEALTH ACT OF 1872.

BY DR. TAAFFE, M.O.H., BRIGHTON.

UNDER the provisions of the above-named Act England and Wales have been divided into urban and rural sanitary districts, the sanitary authorities for the former being the town councils of boroughs and commissioners of improvement districts, and for the latter the various boards of guardians. The Act provided that the appointment of medical officers of health by those several authorities should be compulsory, and that where any portion of the salary was to be paid by Government, the Local Government Board should have a voice in the appointment, dismissal, tenure of office, amount of salary, etc. The Act enabled the sanitary authorities to combine their districts, and in order to set the machinery of the Act in motion, the Local Government Board sent their inspectors to consult with and advise the sanitary authorities. The advice given by those inspectors varied much, but in the end it was generally understood that the Local Government Board recommended the foundation of extensive districts and the appointment of superiorly qualified medical officers of health, with remunerative and adequate salaries. Many sanitary authorities have acted on that advice, and have also accepted the Government grant to the extent of half the salaries; while many others, and this principally in municipal towns, have appointed officers without accepting the Government conditions, thus maintaining their independence of the Local Government Board. So it happens that in many instances we have large districts, formed on no uniform plan, with well although not adequately paid medical officers, whose whole time is devoted to their duties. In numerous small districts, the officers have only nominal salaries; in some instances they are paid by fees for their reports. In some places the union medical officers were appointed as medical officers of health, but such appointments I believe have as a rule been discouraged by the Local Government Board—doubtless, the appointment of the parochial medical officers as deputy medical officers of health would work well. The tenure of office also varies greatly, some officers being appointed for one, two, or three years, others during the pleasure of the sanitary authority. The Local Government Board recommended the appointment of one well-paid officer of health in all large towns, and that recommendation, as far as the appointment of one principal officer, has, I think, generally been carried out in most of the large towns.

The foregoing gives a short history of the immediate results of the Public Health Act of 1872 as far as relates to the division of the country, the formation of combined or independent districts, the appointment, tenure of office, and salaries of the medical officers of health. At the meeting of the British Association at Belfast last year, Dr. Grimshaw, in a very able paper, sketched out a plan which he recommended for the appointments under the Public Health Act of 1872, namely, that the whole should become part of the Government Civil Service of the country. A great deal of fault has been found with the Local Government Board for the shortcomings of the Act of 1872, and the mode in which it has been put into operation; but when we consider that the Act was proclaimed to be intended only as a tentative measure, and that for the first time the whole country has been divided into sanitary districts, and the appointment of medical officers of health of those districts made compulsory, it must be conceded that a great advance has been made on all previous legislation; and now, having advanced so far, further legislation on the subject of public health will become comparatively easy.

There can be no doubt that the Public Health Act of 1872 paved the way for the Consolidation Act of 1875, and future Governments will, in legislating on all sanitary questions have the path made smooth by having the various Sanitary Acts consolidated into one, instead of the provisions of sanitary law being scattered through numerous Acts, making a reference to and a knowledge of them at once laborious and unprofitable. Here we see a useful effect of the appointment of medical officers of health whose duties were found to be impeded by

having to wade through so many statutes for the necessary authority for the discharge of their duties. Another result has been to show that it is necessary in any future legislation that rules or suggestions should be laid down for the guidance of the sanitary authorities in making the several appointments, such as rules for the formation of districts, the tenure of office, for settling on a uniform basis the amount of the salaries. The latter should be fixed in rural districts according to the acreage or square mileage, in conjunction with the population of the districts.

Supervision required by the Rich as by the Poor.

In towns it should be fixed at so much per 1,000 of the population, without respect as to whether the district is a poor one or the reverse, for apart from the question of overcrowding in houses, and density of population, my experience in Brighton is, that the houses of the rich require more supervision from the necessary complication of their sanitary arrangements, than do even the houses of the poor. I quite believe that sanitary authorities would gladly accept such rules (if reasonable) for their guidance, and by this means have uniformity insured throughout the country. There can be no doubt whatever that in any future legislation the subject of the sanitary districts, tenure of office, and salaries of medical officers of health ought to be provided for, and most probably will be so. Although section 191 of the Public Health Act of 1875 is an improvement on section 10 of the Act of 1872, still it is capable of further improvement. Section 191 of the Consolidated Act of 1875 states 'that the Local Government Board shall have the same powers as it has in the case of the district medical officer of a union with regard to the qualification, appointment, duties, salary, and tenure of office of a medical officer of health, or other officer of a local authority, any portion of whose salary is paid out of moneys voted by Parliament, and may, by order, prescribe the qualification and duties of other medical officers of health appointed under this Act,' etc. It is to be hoped that the Local Government Board will hit upon some plan by which all medical officers of health may be placed on the same footing, and so secure uniformity in the several appointments, including qualification and duties, mode of appointment, tenure of office, and salaries of these officers, and the formation of sanitary districts. I imagine another indirect result of the Act of 1872 has been the passing of the Artisans' Dwellings Bill, under which medical officers of health are to take the initiative in putting the provisions of the measure into action. Here we have a most beneficial measure, although both in the Public Health and the Artisans' Dwellings Acts, there is much that is only permissive. In all probability the permissive power will ultimately lead to compulsory power, just as happened in the case of appointment of officers of health. For years the power of appointment was vested in the Sanitary Authorities, and was permissive. Now the appointments are compulsory, and so it will be with most of the permissive powers under the present enactments. The permissive power is the thin end of the wedge. In London and several large towns the provisions of the Artisans' Dwellings Bill are being put into force with great activity.

A very beneficial result of the appointment of Medical Officers of Health has been that the attention of a large number of medical men has been directed to the subject of sanitation; and from the reports in the various journals devoted to that subject, one must feel convinced that a great deal has been done and is doing to remedy, throughout the towns and country districts, the sanitary defects of drainage, water supply, ventilation, overcrowding, etc. The methods for the removal of sewage have been well considered; its utilisation is still *sub judice*. The question of the pollution of rivers still remains for legislation. Attention is being directed to the general subject of public health, including especially vital statistics, to an extent that has never been known before, the result being the creation of a number of scientifically trained men for the preventive branch of medicine, and to promote towards this result the different examining bodies have instituted examinations, and diplomas in state medicine, thus carrying on their old rivalry, and although this is in itself an evil, still the study of the subject of public health will be encouraged. Doubtless the end will be one system of examination for this as for the general subjects of medicine. The University of Edinburgh seems, at present, to be in the van in this matter, a candidate being able to proceed to the degrees of B. Sc. and D. Sc. in the branch of public health. The public health service will have to be vastly improved in order to render it sufficiently attractive to induce medical practitioners to forsake the field of private practice and devote themselves exclusively to the study of preventive medicine. As only three years have elapsed since the passing of the Public Health Act of 1872, and many medical officers were not appointed until long after (it is a question whether the appointments are even yet completed)—I myself was not appointed until 1874—scarcely sufficient time has elapsed to enable an opinion to be given as to the present and future results of the appointments; but as far as may be judged from so short a period, I think it will be granted that a great deal has been done in matters pertaining to public health in the country districts and in many towns.

In the great majority of those houses in which deaths occurred from typhoid fever in Brighton, diphtheria, scarlet fever, erysipelas, many and grave defects were found, on inspection, in the sanitary arrangements. My efforts have been greatly aided by the sanitary authority of Brighton having given me complete control over the sanitary staff. Now Brighton, I must say, stands in the first class of towns as far as sanitary matters are concerned, and if there has been room for so much work to be done here, what must be the sanitary defects in many towns not so favourably placed—for instance, towns like Over-Darwen? Brighton having been for many years a fashionable and health resort, the sanitary authority has not been unmindful of its duties; sanitary work has been constantly going on, but, of course, not carried out in such detail as it has been for the last eighteen months.

Novelty of Sanitary Work.

In most parts of the country sanitary work had to be commenced, as it were, on virgin soil; the districts had to be surveyed or inspected for the first time, the work had to be systematised, the sanitary authorities were not prepared for large measures of sanitary reform, and it behoved medical officers of health to be cautious in their recommendations, in order gradually to educate the public as to

what was or would be required. On the whole, the appointments have, I consider, up to the present time, given general satisfaction, especially when we consider the difficulties which lay in the way of inaugurating a new system, and making it acceptable to the general public and the sanitary authorities. Judging from the various published reports, one cannot but come to the conclusion that, considering the permissive nature of the sanitary enactments, good and satisfactory work has been done, and that the public are now much impressed with the useful results of the appointment of medical officers of health, and that the latter have demonstrated their usefulness in despite of the difficulties of their being mostly new to their work, and the awkward position they were called upon to take up, for, on the one hand, the public expected great things from them, while on the other, the sanitary authorities, having the interests of the tax-payers in their guardianship, exercised a strong controlling influence over the actions of their medical officers, who having been thus thrown on their own resources, and with but little power to compel the adoption of their recommendations, have nevertheless come through the ordeal with some considerable amount of credit, especially, as I have said before, when it is considered how little power they have of promoting the adoption of their recommendations. It seems an anomaly that a medical officer of health shall, after much deliberation and thought, mature a plan and recommend it for adoption, but has no real power to secure for it even the consideration of his sanitary authority. I daresay all these matters will be remedied in good time and in the right way. A good deal of good has been done by educating the public, who have shown themselves only too eager and willing to act on the advice of the medical officer whenever they can obtain it. This has been my own experience up to the present time with but one or two exceptions, and those where they should least be expected. In conclusion, I consider that the results of the Public Health Act of 1872 and the appointment of officers of health are satisfactory, and that the legislature will in future find it an easy task to perfect or improve the sanitary laws, which will, in all probability, to be rendered thoroughly useful and effective, require a little more of the element of compulsion, and also require to provide safeguards against the importation of contagious diseases from infected districts to places free from that class. The present Government has promised to give their attention to the whole subject of public health, and I have full confidence in that promise. Probably had too much been attempted at first a total failure might have been the result. Permissive legislation is educational legislation, to be followed in due course by that which is more complete and more compulsory. A trial of three or four years will be enough to show the general working of the Public Health Act of 1872, or rather of the enactments contained in the consolidated measure of 1875, and will also prove where it is useful or where defective, and the Government of the country will be able to legislate on the subject of public health, the science of which, even now, is generally supposed to be only in its infancy. I have seen many inquiries from medical officers of health, in the various medical journals, as to the best method of determining the death-rate. The plan I have adopted is probably also the one used by the Registrar General, but of that I am not sure. For estimating the population of the whole of Brighton or one of the districts, I make use of Chambers's Logarithm tables. To find the population of St. Peter's District in 1874, the logarithm of the number of the population in 1861 was deducted from the logarithm of the number of the population in 1871, the remainder divided by 10, and the quotient multiplied by $3\frac{1}{4}$ to bring the estimated population up to the middle of 1874. In order to calculate for 1875-76-77, etc., it is only necessary to multiply $4\frac{1}{4}$, $5\frac{1}{4}$, $6\frac{1}{4}$, etc. The population having been estimated, the figures I exhibit are the easiest method I know of finding the death-rate.

DISCUSSION.

Dr. Syson referred to various defects in recent sanitary legislation, and contended that the local Acts of Manchester and Salford were far better than any general Act.

Dr. Farr said the public was much indebted to the readers of the papers, for the work they had done in reference to sanitary matters. He also expressed his approval of the steps taken by Dr. Taaffe to ascertain the sanitary state of Brighton.

Mr. Lamport dwelt upon the evils of centralisation, and expressed a fear that if the principle were applied to sanitary matters it would lead to a general apathy on the part of the public, who would, he thought, be content to leave everything to Parliament. He denied that the Factory Act had produced the good effects attributed to it, and that the operatives would now have been in a better condition if there had been no legislative interference between them and their employers. Official inspection was in all cases, though perhaps beneficial at the moment, prejudicial in the end.

RECENT SANITARY LEGISLATION.

BY F. S. POWELL, M.P.

MR. POWELL briefly reviewed recent legislation on collateral subjects, including the Alkali Act, the Act to compel registration of every birth, the Factory Act, 1865, the Adulteration of Food Act, 1875, which established analysts in every district, and the Artisans' Dwellings Act of 1875. He expressed much satisfaction at the advance of public opinion in favour of the purification of rivers. Already the deposit of solids is universally condemned, and will, doubtless, be forbidden at an early date. The present investigation into the modes actually in use for the purification of rivers will, doubtless, lead to good results, and will, it is hoped, encourage Government to introduce a comprehensive and effective measure. While commenting on recent amendments in the law, and speaking in terms of hearty commendation of recent enactments which create one central authority, erect sanitary authorities everywhere, and bring into one Act provisions hitherto contained in some twenty Acts, drains are now to be ventilated; pent-up gases are not to penetrate houses and, by insidious poison, slay the inmates. But such ventilation has its own dangers. The rain-pipe is a most tempting opportunity; perhaps safe sometimes, it is at all times liable to decay and derangement, and thus becomes a mere conduit from which escaping gases may enter the house. Power is now given to close wells or pumps, public or private.

Foundations.

Of all conditions unfavourable to health, probably none create more disease than damp foundations. It would be dangerous to give any local

authority power to deny an owner the liberty of building on his own land. The law enacts that the authority must construct main drains, that the owner must form private drains, and, under recent statutes, by-laws may, and, he trusted would, provide that walls, foundations, roofs, and chimneys are so constructed as to preserve health. Let these by-laws be carefully framed, and diligently administered, and we should observe a marked decrease among occupants of new houses of diseases arising from damp. With respect to legislation and the effects of legislation respecting medical officers, we move slowly. The facts of public health will never be known in such form and at such a time as to exercise their due effect upon science, and upon actual administration, unless they extend over wide areas or include large populations. The late Act enables the Local Government Board to unite districts for the purpose of appointing a medical officer of health, and to direct the district medical officers of unions within the united district to render this medical officer such local assistance as the board may think fit.

Qualifications of a Medical Officer.

But there is another provision of not less remarkable character. Hitherto, the qualifications and duties of medical officers have been prescribed by the board, in cases where half of their salaries is paid by the Imperial Exchequer, but henceforward the Local Government Board may in all cases prescribe the qualifications and duties of medical officers appointed under this Act. Everywhere there are now medical officers performing their duties under central supervision, and at the same time acting in co-operation with those local authorities on whom the administration of local details must ultimately depend. He hoped, however, that public opinion will not be out-run, and that experience of salutary results will confirm every advance in practical reform. Already good fruit has been produced. In each district there are reports of medical officers published in local newspapers with proceedings of local boards. Can anyone doubt that the public mind will be stirred by these reports. Local authorities take action upon them, and search out the causes which render localities for the time, at least, plague spots and nests of pestilence. But this often comes too late. Before the death, nay before the disease, the sanitary inspector, with friendly vigilance, should have detected the fatal accumulation which caused the sickness, or some authority with firm but kindly hand should have isolated the first victim of infectious disease. The inspection of the district with a view to the detection and removal of nuisances has long been obligatory, and we must now feel more confidence since present vigilance is taking the place of past neglect, the isolation of the sufferer is more uniformly practised, and care is taken to secure the disinfection of houses and clothing. It is, however, deeply to be regretted that Government did not extend security against infection to those attending schools. Compulsory attendance is fraught with peril, unless there be security that infected children are not thereby brought into the school. The simplification arising from concentration of authority and consolidation of the law has already brought greater energy into the action of the Government department, and corresponding activity into local administration. The law is now, to speak in general terms, as free from complication as the nature of a subject full of details admits.

Simplification of the Law.

The authority to execute the law cannot cherish doubts and seek pretexts for inaction from the uncertainty either of authority or of law. The citizen, by perusal of one statute, can, unless vexed by local Acts, readily understand the law he is called to obey. The voter, when exercising his franchise, knows, or can easily learn, the laws, the administrators of which he is called upon to elect. Hence must arise a real and living law, instead of dead enactments; an intelligent opinion in place of sloth and apathy. But of all results which may spring from a new sanitary code, none is more beneficial than the abandonment or restriction within limited proportions of the system of local Acts. Already several have been abolished by provisional order. It must be admitted that early progress was made by local Acts, largely in advance of the general law. But this necessity no longer exists. Some localities may have special wants to be met by local statutes, but in ordinary cases these fall within the range of broad, general principles. But the system is unsound. It is a degradation to the Legislature to sell laws in exchange for fees; it is a wrong to individuals affected by those laws to have no voice in the passing of them, except on payment of legal expenses; it is an injury to the community itself, which often suffers in liberty, or even in health, by the sanction, at the hands of a committee, of clauses which would not bear the test of discussion in the House of Commons; it is an injustice to neighbouring towns whose competition in business with the town obtaining the Act is conducted on unequal terms, in consequence of mischievous privileges conceded by the local Act. In result, and as a conclusion, we may fairly say that we have now a valuable body of Public Health Law. Amendments will, doubtless, be made; some are, indeed, already promised, but laws little serve unless enforced with strictness and obeyed with promptitude. The law is now far in advance of the administration of the law; public opinion passes a statute, but, fatigued by the effort, has not strength to exercise the powers; principles are asserted daily; practice fails to conform to principle. We have all a work to do in this business; upon the co-operation of each inhabitant of this country does it depend to render England as healthy as, compared with other countries, she is undoubtedly happy.

ENGLISH AND FOREIGN WATERING PLACES.

BY DR. JOHN MACPHERSON.

I SHALL confine myself to the two questions: What are the advantages of English as compared with foreign watering places and health resorts? and, What are the best means for rendering English watering places more efficient? I shall not enter on the other questions connected with the subject proposed for discussion, not because they are wanting in importance, but because I have no special knowledge of them. The fact is that the question, even thus limited, is one of enormous extent. The variety of watering places and of health resorts on the continent of Europe is almost infinite; while the watering places and health resorts of Great Britain also differ from each other in a hundred respects. It is, therefore, extremely difficult to com-

pare the two as a whole. Any generalisations on the subject must be liable to be constantly checked by local differences.

Classification of English Watering Places.

English health resorts may be classed as follows :

1. Those sought for their mild winter climates, and almost all of them situated by the sea-side. England has a considerable number of such places, and of varied character, superior, in my opinion, to all inland continental ones, including winter residences in the Alps ; but not equal to places in the Riviera, in Algiers, or in Egypt.

English places of this character are superior to inland continental ones owing to their winter temperature being so much higher ; and, although they want the bright sunshine and the steady fair weather of the Riviera, and are colder than the stations in it, yet the daily range of temperature is less. The main superiority of English places consists in the houses being warmer, in there being more domestic comfort ; in the hygienic arrangements being better ; and in the animal food being more abundant and more nutritious. Patients are also saved a long journey, when they have not strength to undertake it, and avoid the risk of suffering from changes of diet—a very great risk in the case of delicate travellers.

2. Another class of health resorts is that considered to be bracing, and adapted for the warmer portions of the year. Such places are called *Sommerfrische* by the Germans ; and every little place a few hundred feet above the sea in that country has of late been foisted on the public as being such. We have a considerable number of such places in Great Britain, though few, if any, of them exceed an elevation of 1,200 feet ; and, therefore, cannot be compared with the high stations of the Engadine. They are chiefly breezy uplands, such as Malvern and Ilkeley ; some are mountain valleys, as Braemar ; and some are sea-side places, such as Scarborough and Margate, and may be included among them. It is doubtful whether the reputation of Buxton does not depend as much on its climate and its mountain air as on its waters. All of these places supply the same superior comforts as the places of winter resort, unless, perhaps, with the exception of Braemar ; although, with arrangement, they may be procured there. English places of this kind agree with most continental ones in usually having artificial baths associated with them—hydropathic establishments. Turkish and electric baths are met with at them fully equal to similar ones on the continent. The pine-extract baths of the Germans—one of the great attractions of such places—are gradually finding their way to England. Baths of compressed air are occasionally to be found. Milk and whey and grape-cure establishments add much to the popularity of foreign places of this kind ; and milk and whey cures could easily be followed in England, as they were in a past age.

Comparison of English and Foreign Watering Places.

3. It is in sea-bathing places, and in their immense variety, that England is pre-eminent. They are superior to all others in natural beauty, in ranges of magnificent houses, in piers and jetties, and very generally in bathing ground. No country nearly comes up to it in these respects, though France is next it. The Germans have only a few sandy islands. The Dutch are somewhat better off ; and the Belgians have Ostend, with its vast dyke or sea-wall, and that very popular place Blankenberg, with its still larger dyke. The waters of the Mediterranean are too hot in summer to afford the full advantages of sea-bathing. The French are the only people that can compete with us, and their sea-bathing places along the channel, as they face the north, have the advantage of being cooler than ours on the opposite coast. We have fair arrangements now at all our chief sea-bathing places, but some of the French ones are ahead of us in casinoes, public reading-rooms, and more spacious baths. However, English sea-side places are improving in their establishments, and even places in the far north, like Nairn, have very large swimming-baths, exceeding, we believe, in size, anything to be found in Brighton. But we have not a bathing place in which improvements are not wanted, and in which they would not be welcome to its visitors. The creation of shady walks is one of the most urgent wants.

4. As to mineral-water stations, England is undoubtedly inferior to the continent. There is no way of getting over the absence of carbonic acid, and of alkalies, and of warm springs in Great Britain.

Bath, indeed, is our only spring that, whether in mineral constituents, or in temperature, or in bathing arrangements, is on terms of perfect equality with foreign waters of the same class. Harrogate and Buxton, the two next most important, also Leamington and Cheltenham and others, all have their value, but not so high a one as that of many continental springs. The only springs which entirely equal foreign ones, our salt springs, have been but very partially utilised in the case of Droitwich and of Woodhall Spa, but are capable of much higher development, and might be made to produce all the effects of the German *Soolen*, the best known of which in England is Kreuznach.

As things are, and as they are likely to remain—for the discovery of any new important springs is improbable—it would be difficult to say that any English mineral water is superior to foreign ones of the same class.

Improvement of English Watering Places.

The means of improving our watering places and climatic resorts may be considered as special and as general. Taking the special measures first, and bearing mineral waters chiefly in view, a great deal obviously depends on the person or persons in whom the proprietorship of the place is vested. Sometimes the owners are private individuals. In some few cases abroad the bath is the property of Government, but most generally, in the case of the larger and older establishments, both here and abroad, the property is vested in the municipality, and if the municipality is spirited it will carry on improvements ; but a municipality with the best will is often not the best judge of the improvements required. The magistrates of Carlsbad were not wanting in zeal, and even got into debt in order to construct a vast *Cur* and bath-house, and a magnificent colonnade, but both are generally considered to fall far short of what they might have been without any greater expenditure of money. The commonest arrangement in Germany seems to be to have a managing committee, consisting of one magistrate, of one engineer, and of one doctor. In many German, and in most

French baths, there is a Government medical inspector. The duties of that office require both intelligence, judgment, and temper. The office, or rather the official position which it gives, is often a subject of jealousy on the part of the other medical officers. There is great difference of opinion as to the use of the office. It may be, and certainly often has been, very useful.

Great improvements have of late taken place in some of our chief establishments, as at Bath and Harrogate, and Buxton, but even in them there are constantly arising occasions for supplying what may be wanted, and in our smaller watering places arrangements both for drinking and bathing are notoriously defective, and could be improved by the agency of local committees, one member at least of which should always be a medical man, but we must go further than merely improving the sanitary condition and arrangements of a watering place; we must endeavour to make it attractive to visitors. A great portion of the popularity of a watering place depends upon the recreations it offers. Most of the popularity of Brighton, of Margate, of Harrogate, of Scarborough, and of Gillsland is to be attributed to the amusements they offer to the various classes who frequent them. The essential recreations of watering places are to be found in music (morning and evening), in assembly rooms for dancing and for concerts, in reading rooms, in excursions, and in out-of-doors amusements, and in walking and sitting and taking refreshments in the open air, or under the shade of trees. This last practice, universal in towns as well as in watering places in the latitude of London abroad, is not a favourite one in England. Certainly we cannot, in our varying climate, often sit out at night to hear the band play with entire immunity, as they seem to do abroad; although we believe that there used to be more out-of-doors amusements a hundred years ago in this country than there are now, and we might with advantage have more of them. It is of much importance to health that we should be as much as possible in the open air during our short summer season.

We might do more than we do to point out the recreations of a place, if not perhaps in quite so mechanical a way as they do it in Germany, when we observe, for instance, in the programme of a rather dull but valuable bath, besides the usual morning and evening *Cur* music, the following amusements enumerated: Boating in tanks, fishing in tanks, fishing in streams, shooting gallery, skittles, illuminations, the last very probably limited to a few Chinese lamps along an avenue. The special means most likely to increase the popularity of our watering places, we would therefore consider to be the action of intelligent committees in improving the grounds and the bathing arrangements (I say nothing of sanitary improvements and of supervision of lodgings), and endeavouring systematically to supply amusement for the patients. In some cases such duties have been undertaken successfully by companies. If money is not forthcoming for such objects, we see no objection to levying, as they do in Germany, a small tax on those who come to bathe and to make use of the public institutions. Of course it is only in a tolerably crowded place that the income to be derived from such a source would be at all considerable; but in some of the chief German baths we understand that, even since the tables have been done away with, the revenue from this source has considerably exceeded the expenditure.

But if a little slower in manifesting their effects, general measures would in the end be far more effective than special ones, and my remarks on them, though having some bearing on climatic resorts, refer chiefly to mineral waters.

The study of balneology should be revived in England. In former times we had a very considerable balneological literature; now we have really nothing that can be called such, while the literature of the continent on the subject is abundant. Medical men should study more systematically the effects of our various mineral waters and of sea bathing; they should record their cases minutely, and publish their results, whether favourable or disappointing, for we do not want to hear only of the cures affected.

Climatology and Balneology.

The subject of climatology and of balneology should be included in the courses of at least some of our principal medical schools, as it is in French and German universities. In their present ignorance of its principles, medical men are apt to regard balneology as something external to medicine, and to look on the use of mineral waters as a sort of irregular mode of practice. They do not understand the subject, and are seldom able to advise on the selection of a bath, or even of a climatic resort.

This feeling extends a good deal to patients. Englishmen, especially at their own watering places, seem to follow their own discretion very much, and do not place themselves sufficiently under medical treatment. Practically in the use of mineral waters, as of other remedial measures, more depends on the skill and experience of the physician who prescribes them than on the remedies themselves. The remedies may be proper enough, and yet fail if applied injudiciously.

The science of balneology has been advanced in France by the *Société d'Hydrologie*, and by its journal. There are several balneological journals both in Germany and in France. The *Académie de Médecine* has also given prizes for reports on the effects of mineral waters. Of late years, too, several associations of bath physicians have been formed in Germany and in France, and annual meetings have been held with more or less success. Measures of this kind would, no doubt, operate beneficially in England, although they might have to be introduced gradually, and commence on a small scale. They might be originated by the zeal of some of our bath practitioners.

Question of Government Intervention.

It is more difficult to express a positive opinion whether Government should take any action in the matter, and if any, what it should be. From early times they have legislated abroad, but more particularly in France, respecting mineral waters. Mineral springs are, in that country, declared to be of public utility, and on that ground Government has appointed an inspector, often with an assistant, to each station. The inspector's duties are to see that the spring is properly preserved, to give advice about improvements, to report all abuses to the *préfet*; to lay down rules for the use of the waters, though not to interfere with the patients of other medical men, to regulate the tariff of baths, etc.; to give his sanction to the bottling and export of mineral waters; to give gratuitous advice to the poor, and see that they have gratuitous access to the waters. These and many other duties laid down are now, in some measures, obsolete, and the office of inspector seems

to be unpopular in France. We certainly do not need some hundred inspectors, as they have in France, for our few mineral water stations. Three or four of them would be amply sufficient. But we are inclined to believe that one inspector of mineral waters for Great Britain might advantageously be appointed by Government, at least as a temporary and tentative measure. We can scarcely doubt that if local boards were placed in communication with him, he would be able to give more unity to their efforts, and that after a time he would be able to present an authoritative report, giving a dispassionate account of the value of our mineral-water resources. But whether he or some private individual shall undertake such a task, it can not be satisfactorily performed until we have new analyses made of our waters.

Whether the appointment of an inspector be expedient or not, we think there can be no doubt that Government ought, as a matter of public concern and utility, to cause a fresh analysis of all springs of any importance to be made. We think that Government would do well to ascertain the value of the aids to the health of the community which are freely offered by nature. We have no tolerably recent analyses of any important waters except of those of Bath, Buxton, and Harrogate, and have no sufficient evidence of the persistence of the constituents of our numerous cold sulphur and iron wells. As we have already said, the virtues of a well are not always to be explained simply by its chemical constituents; but they very often may be so, and the chemical analysis of our waters is the basis of a scientific knowledge of them. It is desirable that the analysis of them should be a Government undertaking, and conducted more thoroughly and with more independence than is often the case in such inquiries. Such an examination would supply the most important information for the scientific study of the subject.

A more complete and accurate acquaintance with the special virtues of each watering-place would lead eventually to its advantages being more appreciated.

These observations must be considered to be merely short hints which may prove useful to others who work them out, and they are offered with much diffidence, as I have never myself practised as a physician at a health resort, although I have visited a very great variety of them.

This paper was followed by another on the same subject, by DR. E. F. RUSSELL, M.O.H. for EAST SUSSEX.

Sea-side resorted to by Infectious Patients and Nurses.

It is well known (said the author) not only to the members of the medical profession, but to the public generally, that watering places are resorted to by a very large number of those who have been the subjects of infectious disease, and not by the patients only, but also by those relations or friends who may have been in constant attendance upon them during their illness. As it is impossible to say with certainty when, within reasonable limits, these convalescents may be considered to be free from infection—in other words, incapable of conveying disease to others—it becomes no easy matter to solve the question propounded by Dr. Farr, and which he has requested me to dilate upon—viz. 'What are the best means of rendering the English watering places more efficient, for obviating the dangers arising from the occasional introduction of infectious diseases?' However, by placing the difficulties surrounding this question before the meeting for discussion, my views may elicit many seasonable remarks from those who are practically acquainted with the subject. My proposals, crude and incomplete as they may be, will, I have no doubt, be corrected and enlarged by you, so that I trust some practicable suggestions may result from a conference on a matter so important, because so essential to the public welfare.

Registration of Sickness.

It is now admitted, I think, by those who have paid attention to the spread of contagious affections, and therefore the more competent to form an opinion on the cause of their propagation, that these diseases should, as early as possible, come under the cognisance of the sanitary authority of the district in which they occur. How is this attainable? In the first place, it is absolutely necessary that some person should be made responsible for giving notice to the sanitary officials of the occurrence of a contagious case. Who shall this individual be? Some have proposed to make it compulsory upon the medical attendant; others would place such onus upon the friends. At the conference of the medical officers of health of combined districts, held in London about two years ago, it was gravely suggested to pay medical men *one shilling* for such information! The father and mother of the patient, or, in the case of there being no such relation, the master or mistress of the house, must be the parties who should be held liable for giving the necessary intimation—for this simple and obvious reason—that many cases occur in which no doctor is called in.

In a return of pauper diseases which I made to the Government last Midsummer, in stating the number of cases of whooping cough, the word 'about' was objected to by a Government official unacquainted with the details of my work; but this happened to be the only correct mode of giving the figures. Some of the cases were entered in the doctor's book, and several of them were too slight to require any attendance, consequently they were not noted; therefore no correct estimate could be made of their number. In the trivial attacks of contagious disease, when there is no necessity for medical attendance and where no medical advice has been sought, fewer precautions are usually taken; it is then all the more necessary that the medical officer of health should have knowledge of the outbreak, so that he may visit and inspect the premises, give the necessary directions for limiting the spreading of the disease, and furnish a certificate to say 'that the house has been properly disinfected;' lastly, to state when the patient may be permitted to travel without risk to other people. Without such certificate, it should be punishable to remove a patient within six weeks, at any rate, from the commencement of an infectious disorder. An obvious and reasonable objection may be made to this arrangement, viz. that the parents, or the master or mistress of the house, however good their intentions, must occasionally fail to give the required notice, through their inability to determine the nature of the individual's complaint. This may certainly happen, but when it became to be generally understood that a penalty would be incurred by non-compliance with the regulations, a greater readiness would be shown to obtain the advice of a medical

authority upon whom the responsibility of the diagnosis could be thrown; especially when notice of a doubtful case having been sent to the sanitary authority, the opinion of the medical officer of health could be obtained by those persons on the verge of pauperism, or by those who might be unable to pay for medical assistance. In well-frequented watering places, where schools and lodging-houses are so numerous, the above regulations are of the highest importance.

Difficulty of Obtaining Information.

It is not in accordance with our experience of human nature, that a man or woman will run the risk of emptying their pockets by turning their own informer, unless they are compelled to do so. The father of a family, in which there had been several cases of scarlatina, requested a friend to procure some lodgings in a watering place, at the same time adding that it was his wish that the lodging-house keeper should be told that his children had been suffering from scarlatina. The friend did as she was told, and at one of the houses she visited, the landlady replied—'That she was not afraid to receive the convalescents, and if she did not object, she could not see that any one else had a right to interfere.' Just as the student of medicine is confounded by a redundant and useless nosology—so, not unfrequently, is the alarm of the parent considerably diminished, when we make use of the Latin tongue, instead of the more homely vernacular, to designate a contagious disease. In reply to my request that certain precautions may be taken in cases of scarlet fever, I am constantly reminded 'that the disease is only scarlatina, and, therefore, that the directions for preventing the communication of the disease need not be so stringent.' If it becomes a question whether a few people should be put to a little trouble and inconvenience, or whether many should suffer because no precautions are taken to hinder the spread of infection, there can be no doubt upon whom the responsibility should fall. Though it has not been thought advisable to adopt this creed in human affairs, nevertheless it is strictly enforced in commercial matters. By the Contagious Diseases Animals Act, the outbreak of disease is bound to be notified to the police authorities by the owner of the cattle, and the moving of such diseased cattle along a highway is prohibited under a heavy penalty. The veterinary surgeon being a sanitary inspector, and holding a somewhat analogous position to the medical officer of health, is called in to diagnose the diseases of animals suspected of being affected with an infectious disorder. Again, power is given by the law to certain authorities to prohibit the storing up of gunpowder or petroleum in inhabited places; but it has, I suppose, been deemed an interference with the privileges and customs of an Englishman to prevent the storing up of contagious maladies, or the remnants of such diseases, in his dwelling-house.

Prevention of Epidemics.

In England and Scotland it is computed that about a quarter of the mortality is due to epidemic diseases. At Eastbourne we take the most effectual measures to obtain a knowledge of the occurrence of contagious disorder. In accomplishing this important step, we have been solely indebted to the able and willing co-operation of medical men in the town. The sub-inspector of nuisances leaves at their houses a note with an envelope; he calls for its return on Monday evenings, takes it to the head inspector, who opens it and forwards it to me, if necessary. Formerly, before I was appointed, this paper was returned without an envelope. I always thought it most objectionable that any communication concerning disease—private or pauper—should perchance be read by anyone but the head inspector and myself. To the note and envelope there can be no objection, provided always that the Medical Officer of Health be discreet in his actions, and if he be debarred from private practice, for obvious reasons, he will be in a better position to ask favours from those *confrères* upon whom at present he has no legal claim. Having obtained information of the outbreak of any contagious disorder, if the patient be a pauper, we immediately visit and inspect the house and premises, give the necessary precautions, and supply disinfectants. Should there be any children in the house, we give the name and address to the master or mistress of the public schools, in case any member of the family should be a pupil; occasionally we interdict the children adjoining the infected house from attendance at the school. As soon as convenient, the dwelling, or part of it, is disinfected, and the landlord has notice to whitewash. As to the private cases of disease, we usually place ourselves in communication with the medical attendant, and the inspector offers his services for the purpose of disinfection. It is often most desirable to remove the patient, especially if the outbreak happens in a school; for this purpose the Local Board have a special vehicle. A short time since, the day after a child returned to school from London, she exhibited symptoms of fever, she was at once taken back to town by means of this carriage, which was placed on the rails. I do not say that we are told of all the private cases, but I have made this rule respecting them; if they are returned to me in the above form by the medical practitioner. I do not visit them (the house and premises have most probably been already inspected, and their condition recorded), unless I am requested to do so; but if no notice of the complaint has been sent to me, and I hear of the cases incidentally, I consider myself free to act as I please. I need scarcely say that all towns should be provided with a fever hospital. At Eastbourne we have only a few rooms in an old building, belonging to the Guardians, ill-adapted for the purpose. Brighton is fortunate, not only in having some eighteen fever-beds at the County Hospital, but also a large number—about fifty, I think—in a separate building on the workhouse grounds.

Having been a Guardian of the Brighton Union for seven years, I can speak from experience of the beneficial results arising (at the time of a severe epidemic) from the admission, by the Master of the workhouse into the latter building, of cases of fever and small-pox, without any hard and fast line being drawn between those who were strictly paupers and those not entitled to parochial relief.

Benefits of a Disinfecting Chamber.

About four or five years ago, the Town Council of Brighton had the wisdom and forethought to erect jointly with the guardians a large disinfecting chamber, in which a temperature of 260° can be obtained. By this arrangement the clothes and bedding of private families could be disinfected, as well as that which belonged to those who had been admitted into the infirmary. During the above epidemic, I was an eye-witness to the good effected by

such provisions for both paupers and non-paupers. In determining the precise advantages we gain by disinfecting a house or part of a dwelling, we may certainly appeal to the practical results of our proceedings without speculating on the learned disquisitions on disease germs of such great authorities as Pasteur, Tyndall, and some others, and without being sceptical of the direct and destructive effects which our disinfectants may or may not have on the vestiges of disease. Assuming even that disease germs are not thus wholly destroyed, the process of disinfecting rooms or houses necessarily often disturbs and removes a vast amount of dust and dirt, which in some places have been accumulating for many years. To the inspector of nuisances, who has disinfected, succeeds the whitewasher, followed, perhaps, by the painter and paperhanger; lastly, the rooms must, after these derangements, be thoroughly cleansed and washed. Many of the labouring classes like to see some paper on the walls; in some of the dwellings, as we know, this paper is of various patterns, collected and put on at different times, so as to represent a kind of patchwork; and though we are occasionally met by a refusal on the part of the tenants to remove this, yet the sulphurous acid fumes often come to our aid, so defacing it that it must of necessity be taken down. Before I finish I have been asked to say a few words on determining the annual rate of mortality in these watering places; before doing so, I must premise the amount of faith I have in such compilations. Speaking generally, I do not for one moment distrust the national system of death-rates, notwithstanding the attacks made upon it by such able men as Drs. Letheby and Rumsey. I am well aware that a high death-rate, for all practical purposes, does indicate a low state of salubrity; but I stop here. If we sift the reported causes of these deaths, and thus endeavour to obtain accurate information of the nature of the disease which prevails in one district more than in another, we are at once treading on slippery ground. I have had much practical experience in 'death returns.' I have long since learned that no precise data could be based on such 'sanitary statistics.' Since I have held the appointment of medical officer of health of a combined and extensive area, I have been brought into contact with the copies of a large number of death certificates which are forwarded to me by the sub-registrars, and my opinion of their small statistical value has been still more abundantly confirmed. In determining the annual rate of mortality in a watering-place from the Registrar General's tables, we have first to ascertain if the town be a registration district by itself, or whether several places in the locality are included in it for the purpose of forming a registration district. On this account the returns are often misunderstood, and erroneous conclusions are formed. The column of figures headed 'Vital Statistics,' published periodically in one of the local daily papers, gives for this reason no information of the exact localities in which certain diseases have proved most fatal; and in my first sanitary report to the Local Board of Eastbourne an anonymous correspondent in a public journal asked for an explanation of the 'startling discrepancy' between my figures and those of the Registrar General; when I reminded him that the registration district included a number of villages as well as the town of Eastbourne. Another equally important question to consider is, not merely whether a town be much resorted to by visitors, but whether from its locality or climate it ministers to the relief of a certain class of ailments—in other words, if it be well known as an especial sojourn for those persons affected with 'organic complaints,' that is, with disease tending sooner or later to a fatal termination.

Calculation of Death-Rates.

We can readily appreciate the necessity of considering an element which must be of much significance in calculating the death-rates of such towns as Hastings, Ventnor, Torquay, or Bath, and I may add Brighton; though at many other places frequented by visitors the deaths amongst them are so few that the number is scarcely appreciable in the registrar's return. But assuming that for certain districts we should make two columns, one for residents and the other for non-residents, where shall we draw the line? In dissecting the deaths, how shall we determine correctly who is a visitor, and who shall make the necessary inquiries? As to the source from which our information might be derived. The quarterly returns of sickness and deaths furnished to the Government by some of the medical officers of health are limited to the enumeration of pauper cases. From causes well known to such officers, it is impossible to give the paupers' deaths correctly, except by means of one agency—that of the relieving officer. If this official be at the same time a registrar of deaths, he can, with but a small expenditure of time and trouble, place the letter 'P' against the name of the person whose certificate he has copied in making his return to the medical officer of health, and who had been, up to the time of his decease, in the receipt of parochial relief. In like manner, we might ask the assistance of the registrar in ascertaining how many deaths in his district have occurred amongst non-residents. As a rule, I should say that he obtains such knowledge from the person who attends at his office to register the death, without any questions specially directed to elicit information; if not, it would only demand a little closer inquiry on his part, and thus the letter 'V' might be placed against the name in the obituary record, without throwing additional labour upon anyone. How shall we define a visitor? The Medical Officer of Health for Hastings tells me 'that in his town the Registrars consider anyone a visitor who does not rent a house, or part of a house, for six months consecutively.' I am well aware that by such an arrangement even a strict line cannot certainly be drawn between a resident and a non-resident, but I shall be glad to learn by what other agency a better mode of obtaining more precise information can be devised. In small towns only would it be possible for the Medical Officer of Health to determine these queries by his own researches; and even when thus feasible it would necessitate a call at the late abode of the deceased person, which would be irksome to the public official, and annoying to the friends. Deductions must, of course, be made for some of the deaths in workhouses, hospitals, and other charitable institutions. Brighton Union includes none of the surrounding villages, yet partly from the size of the town, and partly from the workhouse being popularly known amongst a certain class of individuals as a relatively comfortable abode, it is much resorted to by many who are non-residents. The hospital (named the Sussex County) is cosmopolitan; acute diseases, and severe accidents from very long distances, are constantly being received into its wards.

The Eastbourne Union, though very small as compared with Brighton, yet, besides the town, now numbering about 12,000 inhabitants, contains in addition, twelve villages. Hastings Union also, I believe, contains, besides the town itself, many of the surrounding villages. The density of the population on a given area, with its social state and habits, should not be forgotten.

Reverse and Obverse.

Brighton has a very large number of people living in confined spaces; in fact, having visited much amongst them, I have sometimes been thus reminded of the rooms and dwellings of the London poor. In this, as in all other large and wealthy towns, the splendour can be seen by anyone—the squalor only by a select few. A high birth-rate had been urged as affording some explanation of a high death-rate. This I must leave for discussion—if thought necessary by the meeting—as I do not consider it absolutely proved to be correct. If in our sanitary reports we stated that the infant mortality in our district had been very low, we must assuredly at the same time inquire whether there had been a high or low birth-rate. In the neighbouring parish of Hove, I believe that the infant mortality has been very low; but I am not aware that it is generally known that the birth-rate is also very low. In such favoured watering-places as Brighton or Eastbourne, where, as compared with other places, there are a very large number of schools, I certainly do consider the 'distribution of ages' as influencing the death-rate. Deaths are very rare amongst a number of young healthy people between ten to twenty years of age. I do not consider the effect of sex distribution as exercising any appreciable influence on the death-rates of watering places. Lastly, I shall very briefly touch upon, yet not consider, marriage as of importance in the death-rate of watering-places; though the ladies may be gratified to learn that Dr. Stark had called attention to the fact 'that the death-rate of unmarried men was considerably higher than the death-rate of married men and widowers;' and so convinced was Dr. Stark of this fact, that it had been said 'that bachelorhood was more destructive to life than the most unwholesome trades, or than residence in an unwholesome house or district, where there never has been the most distant attempt at sanitary improvements of any kind.'

DISCUSSION.

Mr. G. I. Leon (of Hove) said he had much painful experience of watering-places, and within the last six months, especially in Brighton. Dr. Fussell had not mentioned that doctors themselves were sometimes the means of conveying infection.

Dr. R. P. B. Taaffe (Medical Officer of Health for Brighton) said that Brighton, being so near London, was perhaps more liable to the importation of infectious disorders than many other places. He agreed that there ought to be legislation to prevent such importation. He did not think it would be desirable to compel medical men to give information as to contagious diseases among their patients, the friends of whom should have the responsibility cast upon them. Without regard to the definition of 'residents,' he thought that all persons who had lived in a place twelve months might be so designated. With reference to the different birth-rates, it was a noticeable circumstance that Preston stood the highest of any in the district, it being 58 in 1,000. As to the case mentioned by Mr. Leon, he was sorry that gentleman had not communicated with himself respecting it. If he had done so, it would have been thoroughly investigated. Officers of health were placed in a very delicate position in regard to the communication between medical men and their patients; and if imperfect information was given as to the cause of death, they might sometimes be put off their guard.

Mr. Alderman Mayall said that medical men were generally very cautious in taking means to prevent the spread of infectious diseases by themselves. He believed that such diseases were often spread by imperfect laundry arrangements, and he recommended that laundries should be regularly inspected. Medical men (who had a monopoly by Act of Parliament) should, he thought, be required to report rigorously, and without regard to personal consequence, every case of contagious disease.

Lord Aberdare reminded the meeting that if a manufacturer negligently used poison in the colouring of wall-papers, and death occurred in consequence, he might be indicted for manslaughter.

Mr. P. H. Rathbone suggested that elementary schools might be utilised for the collection of sanitary statistics.

Professor Wanklyn said it was impossible to disinfect large masses of material, which could only be dealt with by being subjected to a high temperature or burned. The numerous 'rookeries' in Brighton and London ought not to be pulled down, but to be burnt down. The houses removed for the erection of the new Law Courts should have been burned down. The materials were now spread over London, and were scattering disease among the people; and the cost to the nation of adopting that course would equal a year's national revenue.

Dr. Farr believed that English watering places were quite equal as health resorts to any of those on the Continent; and Brighton was justly called the Queen of Watering Places. Of course the sanitary condition of such places should be of the first order. He was not like Mr. Towle, afraid of town-sewers; but these should be well trapped and flushed in order to make them perfectly harmless. Professor Wanklyn's proposal for burning down rookeries might, he thought, be tried; but the Professor himself should be required to superintend the process, and be responsible for the conflagration not spreading. He thought the children who had had measles, scarlet fever, etc., might be better dealt with at home instead of being taken to the seaside. If such patients were permitted to come to health-resorts, they should be sent to localities specially appointed for convalescents. Such cases as that mentioned by Mr. Leon should be carefully investigated; and the prevalence of special diseases in different watering places should be regularly made known for the information of the public. He had no doubt that Brighton would henceforth be classed by the Registrar General among 'principal towns.'

Dr. Hardwicke mentioned a plan adopted at Brussels for ascertaining the sanitary state of different parts of the town by means of a large map; the bad localities being indicated by small pins. He also referred to the method of obtaining statistics which he had adopted at Paddington.

Mr. H. H. Collins recommended the certifying of lodging-houses as healthy dwellings with a view of giving confidence to visitors, who had at present

no means of distinguishing healthy from unhealthy districts.

Dr. Robinson described the steps taken at Dover with regard to the importation of infectious disorders. He suggested among other things special railway carriages for the conveyance of convalescents, and the adoption of some means of ascertaining what children returning to boarding schools were in a healthy state. He also recommended a systematic inspection of lodging-houses for the protection of visitors. Such measures, however, he said, could not well be carried out in the absence of an enlightened public opinion. The speaker then described various modes by which he had known infectious disease spread, and urged the importance of isolating infected patients in hospitals, and destroying or disinfecting their clothing.

The President said it appeared that they were all agreed that English watering places bore a favourable comparison with any others, but it was singular that they showed such great differences in point of mortality, the death-rate varying in ten years from fifteen at Bognor to twenty-four at Whitby. He then alluded to the importance of registering disease as well as death, including the diseases of animals and plants. Only by such registration could the proper means of prevention be ascertained and adopted. He agreed with other speakers as to the desirability of certifying lodging-houses in watering places, and he thought it would only be fair to the lodging-house keepers that their visitors should bring certificates as to their own freedom from infectious disease. There was no doubt that the laundry was one of the most common causes of the spread of disease. Thatched houses could scarcely ever be properly disinfected. He regarded two months as the shortest time required for securing immunity from infectious disease.

Dr. Fussell then replied. He said that medical men were extremely careful in regard to communicating infection. It had not been mentioned that infection was occasionally communicated by nurses. The material sometimes worn by lady-nurses (linsey) was very objectionable, and ought to be abandoned.

Mr. Collins proposed and Mr. Rathbone seconded the following resolution : 'That it be recommended to the council to suggest to the local sanitary authorities of our English watering places and health resorts, the desirability of establishing a system by means of which owners of lodging-houses and hotels should be enabled to have their premises inspected by a competent authority, and certified if found free from infection, and in a general healthy condition with reference to drainage and other sanitary arrangements.'

The resolution was unanimously carried.

Mr. Leon then moved, 'That it be recommended to the council to take into consideration the desirability of compelling, by legislative enactment, medical men attending cases of an infectious character to report the same to the medical officer of health.'

Dr. Squire seconded the motion.

Dr. Fussell thought that the responsibility of reporting cases of contagious diseases should be thrown upon the friends of the patients, and not upon the medical men.

Dr. Littleton expressed a similar opinion, and protested against the resolution, which he declared to be a monstrous one.

Dr. Farr thought it would be an invidious thing to compel the medical man to report all his cases to public officers.

After some further discussion, feeling was expressed against adopting the suggestion of Mr. Leon, that gentleman altered his resolution so as to make it simply declare the desirability of reporting all cases of an infectious character, not placing the responsibility on the medical man. Ultimately Mr. Leon's resolution was unanimously adopted.

ON ASSIMILATIVE FOOD.

BY W. J. COOPER.

Nutriment.

NUTRIMENT properly defined consists of all the various alimentary substances necessary to build up the human body. And as starch forms the greatest proportion of the necessary aliment so starch is in one sense the most important element of nutrition. Some statements have recently appeared to the effect that starch was in no sense nutritious, and if taken alone must lead to starvation. If this argument was intended to prevent people from partaking of starchy foods, it must have been put forward without that careful consideration which the importance of the subject demands. I do not believe that ordinary people would starve, in the strict sense of the term, even if fed on arrowroot and water, or its analogue, corn flour and water. As I stated, in a paper read in the Chemical Section of the British Association at Belfast, I once lived for a month upon arrowroot and water, and I have been grateful to starchy food ever since. I should be the last person to recommend such a diet to anybody, or indeed any dietary whatever as a universal remedy for weak digestion or malassimilation of food. Many people have endeavoured to concoct a complete dietary and have signally failed. The only complete dietary known is the milk which the mammalia provide for their young, but even that diet must not be interchanged without caution. If cows' milk be given to an infant child as a substitute for its mother's milk, it should be diluted to the extent of one-half for the first three months of the child's life, and one-third for the second three months; otherwise it would not be properly assimilated.

Thus it is necessary in this instance to deprive this natural dietary of some of its nutritive properties, and add known quantities of other substances. Starch is as necessary to the structure of the human body as bricks or stones in the construction of a house, and an attempt to build a house of mortar alone or cement alone would be as abortive as an attempt to rear a child upon gluten or nitrogenous matter exclusively. It has been objected to such foods as arrowroot, corn flour, and especially in the case of corn flour, that the gluten is entirely extracted, and that, therefore, these finely divided powders are not nutritious. Such objections are somewhat similar to the objections made some years ago to extraction of quinine from bark, or morphia from opium. At the beginning of this century opium was known, but its active principle was unknown. And bark, the ancient remedy for ague, was used for centuries before its active principle was found to be quinine. It was imagined that there were hidden and mysterious virtues in the combination which would be lost if a separation was attempted. It is of

the utmost importance that medical men should be able to administer exact quantities of any active medicine; and it is of no less importance that invalids and children should be fed with such proportions of assimilable food suitable to their various constitutions. Arrowroot and corn flour, from the delicacy of their structure, are easily converted into gelatinous and readily assimilable aliments, and the fact that they consist almost entirely of starch, enables the doctor or the nurse to admix with other alimentary substances the proper quantity of this nutriment which forms four-fifths the weight of the food of a large proportion of the inhabitants of the world. There is also another very sound reason for the abstraction of the nitrogenous matter from corn flour, it enables the manufacturer to grind it finer and get into a form which renders it, when boiled, gelatinous and digestible. There is no doubt much infantile mortality is caused by ignorance in the matter of children's diet. Some people are in the habit of giving meat to young children. Children should be fed on milk as long as they thrive upon it. But no child less than twelve months old should have anything but milk, or milk with sugar and water. If people are anxious that their children should thrive and grow up healthy and strong, too much attention cannot be given to the matter of their daily food; and great care should be taken that the dainty child has sufficient nourishment.

Necessity for Studying the Constitution.

It is not only that the quality of the food must be good, and the quantity sufficient, but the child's constitution should be studied with the object of ascertaining the nature of the food which is likely to be assimilated. It should be well understood that large quantities of food may pass through the body without nourishing it any more than the odd articles which children sometimes swallow, such as paper, grass, packets of pins, or even street-door keys, of the swallowing of which last article I remember an instance. It is notorious that some lean people have voracious appetites, whilst the fat ones eat comparatively little.

The reminiscences of the objectionable lump of fat or raw meat of schoolboy days, which it was treason to leave on the plate, must be present to the recollection of many people. Fortunately there was always a boy of carbonaceous proclivity to whom the objectionable morsel could be furtively passed, and who would devour it with the avidity of an Esquimaux.

Too much meat is eaten in this country, and the cattle disease and increasing price of meat may prove a positive benefit if it should prevent some people from eating more than is good for them. Excess of nitrogenous food is believed to be the cause of many of the diseases of the kidneys, which are so prevalent in England. As nitrogen is excreted by the kidneys, those organs if overworked will in time degenerate, and, not being able to perform their proper functions, their work is thrown upon the other excretory organs, and if they fail blood poisoning takes place, and the victim of an excessive nitrogenous diet is killed as if by an overdose of a narcotic.

The natives of the Sandwich Islands have a favourite food, which they subsist on almost entirely; it is a kind of paste made from the root of the Kalo (*Arum esculentum*), a plant cultivated throughout their country. The root when boiled is made into a paste and called 'Poi.' This is the food of all classes of Sandwich society, and according to the wealth of the individual so is the consistency of his food. Knives and forks are not fashionable among the natives of the Sandwich Islands, and they eat 'Poi' with their fingers. The most expensive kind of 'Poi' is the thickest, and a sufficient quantity of it can be conveyed to the mouth by one finger, it is therefore called 'one-fingered Poi.' The second quality being more diluted requires the assistance of two fingers to convey it to the mouth, and that is called 'two-fingered Poi.' The third quality, and most dilute, is called 'three-fingered Poi.' Abyssinians eat raw meat and praise the cordial and warming effects upon the system produced by its assimilation. According to Burton, the Arabs of East Africa say that vegetables cause heartburn and acidity, and Livingstone found that ground-nuts containing oil would neutralise this tendency. One of the most objectionable things that can be given to children are the stimulants or narcotics which are used in enormous quantities in all our large towns. Advertisements appear of 'somebody's Soothing Syrup,' a real blessing to mothers, but little do the poor people think that the blessing of a little peace to the mother is obtained at the possible price of a lasting curse to the child. It is of little use to lay down any general rules of diet. Different climates and different constitutions necessitate alterations in dietary. Gardeners have learnt how to supply the food which different plants require for their development. Parents and those who have the rearing of children should study the food which children of differing constitutions require, and secure to them the inestimable benefit of assimulative food, bearing in mind the ancient but literally truthful adage, that 'what is one man's meat is another man's poison.'

SANITARY ARCHITECTURE AND APPLIANCES.

BY GEORGE GODWIN, F.R.S.

Scope of Social Science.

MR. GODWIN, in the course of an able lecture, said it was sometimes urged, mostly by persons not fully acquainted with the scope and proceedings of the Social Science Association, that at its congresses matters were discussed which were not reducible to laws, doubts that cannot be determined, caprices rather than science; and that, after a great deal of talking and writing, little is removed from the cloud-land of 'I think' to the permanent domain of 'I know.' If the proceedings of any of the departments did offer foothold to such an objection, he would not find it in the midst of the exhibition of sanitary, educational, and domestic appliances organised (and organised annually), in connection with the Congress of the Association. The exhibition was arranged under six headings, and it was of the third of these that he had been requested to speak, viz., 'Sanitary Architecture and Appliances for Outward and Interior Ornamentation.' What might be rightly termed Sanitary Architecture was not too often produced. The reverse was everywhere about us; courts and narrow streets; rooms underground; houses built back to back without the means of ventilation,—damp, stuffy, and fetid,—while in residences of greater cost there were found

insufficient drainage, sealed-up bed-rooms, and cisterns communicating with the drains, and so receiving and disseminating poisonous sewer gases. If we looked to public buildings, there was little less to be condemned. Hospitals, until a few years ago, when some worked hard to make known the advantages, and enforce the adoption of what is termed the pavilion plan, were places where patients had less chance of recovery, aided by the most skilful surgeons or physicians, than they would have had if placed under a tent in a field, with an old woman for doctor; and even now there were such evil-conditioned buildings in use.

Examine into the condition of our schools, and it would be found that many of the arrangements were destructive of health. Scores of children were crowded together without proper or indeed any arrangements for the removal of the vitiated air and the supply of pure air. The schools erected by the recently appointed School Boards mostly show proper attention to the sanitary requirements, but they were at present deficient in objects of delight. The walls of the school-room should be used to educate the eye, improve the taste, and elevate the nature of the rising generation.

Leaving for a time this question of beauty as a sanitary agent, he noticed that a feeling seemed to be growing up which would eventuate, it may be hoped, in a general demand for sanitary architecture, —that houses shall be built not merely to sell, but fit to live in; with all those arrangements which make healthful and vigorous life possible. Mr. Godwin went on to describe the various exhibits in the sanitary department, and in connection with his subject, referring especially to that of concrete, the application of pottery, drainage appliances, cistern connections, and earth closets. Uninteresting as some of these matters might appear, they went to make up a whole of supreme importance—the production of healthful, happy homes. The largeness of the interests involved, and the enormous extent to which good or bad arrangements in house-building applied might be shown by a few figures.

In 1874, there were built in London alone 7,800 houses, and 3,500 more were in progress. Taking as an average cost per house 300*l.*, and those in progress at half that sum, there were, in that year, 2,865,000*l.* spent in house-building in the metropolis alone. The length of new streets and squares built in London within the last twenty-five years was found to be 1,181 miles; and giving 18 feet frontage to each house, and retaining as the average cost per house 300*l.*, there was an expenditure of close upon 104 millions sterling. If the population continue to increase as it has done, there must be more than a million of additional houses erected within the next ten years, at a cost of at least 300 million sterling. These figures showed how enormous was the field over which good or bad building extends, and how important it was that these immense sums should be spent in the manner best calculated to conduce to the health, progress, and happiness of the people of this kingdom.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

The first meeting of the session will be held at the Scottish Corporation Hall, Crane Court, Fleet Street, on Saturday, October 16, at 7.30 P.M., when the President will deliver an inaugural address 'On some directions of Scientific Work by Medical Officers of Health.'

LECTURE ON SANITARY ENGINEERING.

BY BALDWIN LATHAM, C.E.

Sanitation among the Ancients.

THE lecturer said there was no doubt that countless ages ago very much was known of sanitary science, probably as much, if not more, than we do at the present day. But with this, as with other useful arts, history has been neglectful. The memorials of our greatest benefactors have been lost; but knowledge of this fact comes from other sources. At Mexico it has been shown that sanitary science must have reached a high degree of perfection there, for previous to the conquest of the country by the Spaniards, the towns were thoroughly and efficiently supplied with water by the most perfect system, and each house had a service laid on. Twenty-five centuries ago ancient Rome was drained by a sewer which still serves a similar purpose; and discoveries in Jerusalem, Nineveh, and Pompeii, also tend to show that sanitary science received a considerable amount of attention with the ancients. In proof that the science continues to make progress, he mentioned that in London two hundred years ago the mortality was eighty per thousand, but has now been reduced to about twenty-two and a half per thousand. Referring next to drains, he proceeded to point out the absolute necessity of ventilating them. It had been shown that sewage did not flow evenly; but its force fluctuated, and when it came with greater force there was a consequent greater pressure on the air, which unless ventilation was provided would find an outlet somewhere. By experiments he also showed the necessity of ventilating the pipes in the houses, to prevent the escape of foul air, which was sure to take place if it were not provided. With regard to the water-supply, he regarded it as an absolute necessity that there should be a constant supply. Not only was this required for the extinction of fires, and the flushing of sewers, but otherwise water had to be kept in close impure tanks, and soon contracted impurities. In fact, the purer the water, the more likely it was to contract impurities. In conclusion, he pointed out the imperative necessity for providing in all water fittings a back-pressure valve to prevent an in-current of air. Where this is not done foul air gains admission to the mains, and so the water becomes poisoned.

THE SANITARY EXHIBITION.

BY CAPTAIN DOUGLAS GALTON.

CAPTAIN DOUGLAS GALTON, C.B., D.C.L., F.R.S., lectured on warming, ventilating, and lighting. We reproduce such portion of the lecture as had special reference to the articles shown in the Sanitary Exhibition. 'In this exhibition the first mode of warming, viz.: by open fire-places, is the one which appears to preponderate. But there are specimens of warming by hot-water pipes. Mr. Walter exhibits a combined arrangement for warming and ventilating hospital wards, and Mr. Shrewsbury exhibits a gas apparatus for heating hot water coils. The open fire-place is an admirable engine for ventilation. A good blazing fire in a chimney flue of extraordinary size, viz., fourteen inches by nine inches, will create a velocity in the chimney of from ten to more than fifteen feet per second, and remove a

volume of air varying from 30,000 to 50,000 cubic feet per hour. With an open fire-grate of ordinary construction the warmth in the room is derived from the direct radiation of the fire. The greater the draught up the chimney, the greater is the inflow of cold air to replace that removed, and the greater inducement is there to make the fire blaze to increase the radiation. But the more the fire blazes the faster is the draught up the chimney, and the consequent removal of air from the room. Therefore the tendency of the open fire is to accelerate the evils which it is intended to remove, and whilst it would roast us on one side it would nearly freeze us on the other. Thus the open fire requires for its perfect action a continual supply of fresh warmed air. This is sometimes provided by a heating apparatus placed in the basement of a house from which flues are carried to the several rooms : and this is no doubt a far preferable arrangement to that of allowing the fire to draw supplies of cold fresh air through the chinks of the doors and windows. The waste of heat in an ordinary open fireplace is, however, enormous—assuming the whole amount of heat developed by coal at 100 parts, forty parts will go to warm the chimney, forty parts will pass away wasted to pollute the atmosphere ; and of the remaining twenty parts, the greater portion is utilised as work done in burning the coals, leaving a very small portion to be effective in warming the room. Some of the heat of the chimney is required for ventilation ; but in every open fireplace there remains an enormous margin of unutilised heat which should be made available for warming the fresh air required to supply that removed by the chimney. It is to the utilisation of this waste heat that we should look for economy in open fireplaces, and moreover, by preventing so large a portion of fuel from passing into the atmosphere in the form of smoke, we should materially improve the purity of air in large towns. The best way of utilising this heat is to employ it to warm the fresh air which is required in a room to replace the air drawn out by the fire up the chimney. By a proper adaptation of this system the saving of fuel by so using this wasted heat will be equivalent to two-thirds of the consumption of an ordinary open firegrate. The heating surface should be sufficiently large to prevent the air being varied to a temperature of below 75° Fahrenheit. The warmed air should be admitted near the ceiling. These conditions will prevent any draught being felt, and will ensure uniform temperature. The ventilating fireplaces in barracks fulfil these conditions. In towns, to prevent the dirt in the outside air from entering and blacking the room, the air should at its entrance be passed through a cotton-wool filter. These retain the impurities, and rooms to which the filtered air is supplied will be markedly purer than that of other rooms. There is a further practical evil connected with open fire-places, viz. : the dust created in a room in the operation of cleaning the grate and laying the fire. To an invalid it is often torture.

There is a novel apparatus well worthy of examination exhibited here, by Mr. G. B. Sharpe, by which he proposes to place the fuel in an iron movable grate or cradle provided with a cover. He proposes that this cradle should be taken away in its cover for cleaning, and brought back ready laid for use. Amongst the apparatus for warming which are exhibited, it will be observed that some of the exhibitors propose to use gas ; and there are some descriptions of apparatus intended to consume mineral oils. Gas is very much more expensive than coal as a permanent means of providing heat. Coal costing 30*s.* a ton would, at a cost of 1*d.*, generate as much heat as an amount of gas costing 3½*d.*, assuming the price of gas to be 5*s.* per 1,000 cubic feet. But, on the other hand, for occasional or intermittent use, gas would be more economical. Gas for heating purposes is useful in many places where there is no convenience for a chimney capable of removing the smoke which a coal fire would create. But gas burnt in a room contaminates largely, and consumes the air of the room. When gas stoves are used in rooms for heating purposes, it is essential for the health of the occupants that they should be constructed on the principle of entirely removing the products of combustion into the outer air, and of bringing into the room a supply of fresh warmed air. Any gas stove for heating purposes which departs from these conditions is dangerous to health. The apparatus for domestic heating purposes in which mineral oils are to be used, are, as is the case with gas, advantageous for intermittent use and in places where chimneys are difficult of construction. Mineral oils are quite as cheap as gas, and the same principles should be observed in the apparatus for their combustion. Apparatus for lighting by artificial light is not very fully represented in the Exhibition.

There are, however, specimens of lamps for gas and mineral oils which deserve consideration. The conditions of illumination depend upon the method and quantity of the air-supply which aids the combustion ; and the relative merits of different burners mainly depend upon the skill with which this air-supply is regulated. It is very interesting to examine the manner in which different inventors have regulated the air-supply in the several lamps recently introduced for burning mineral oils. The more powerful the light, however, the greater the quantity of air consumed, and the greater is the emanation of products injurious to health. The contamination of the air by artificial light is not confined to gas. Indeed gas may be said to be less injurious than other materials used for lighting. Experiments made by burning different combustible bodies with an equal amount of light in atmospheric air, and noting the time at which the flame becomes extinguished by the contamination of the air, show that whilst colza oil was extinguished in seventy-one minutes, and wax candles in seventy-nine minutes, coal gas (thirteen candles) burnt for ninety-eight minutes, and cannel gas (twenty-eight candles) burnt for 152 minutes.

The reason why we experience more inconvenience in the case of gas than with lamps and candles is because we have so much more light when we use gas. In ordinary rooms, where the sunlight is not available, gas lights are either burnt in the room without any attempt to carry off the fumes, or in some cases the light is enclosed in a globe, and a pipe is provided up to the ceiling and along the ceiling to the chimney flue to carry off the products of combustion. This pipe will not always be found to be efficient, especially in a room where an open fireplace is in action. The smallness of the pipe, the bend, the horizontal length in which impurity collects, all contribute a large amount of friction which tends to diminish the draught in the tube. The open fire draws a large amount of air towards itself. The currents in the room conflict, and the fumes from the gas burners are liable to be drawn towards the fire and to mix with the air of the room. Moreover, in rooms where there is no arrangement

for replacing by fresh air the air removed in ordinary course by the chimney of an open fireplace, cross currents frequently prevail in the chimney, which further check the draught. For these reasons a gas burner for lighting an ordinary dwelling room should be enclosed in a globe and entirely cut off from the air of the room, and supplied with air directly from the open air. The fumes from combustion should also be carried direct into the open air. Such an arrangement is very simple in the case of lights near the outer wall of a room, and in the case of a lamp suspended from the centre of the ceiling the only care required is to allow an extra area in the horizontal tubes in the ceiling which remove the fumes and bring in the fresh air, and to make arrangements for isolating the tube conveying the fumes, so as to obviate risk of fire from the heat of the tube.

Coal gas is a very convenient source of artificial light, but it has its disadvantages. It is dangerous; its conveyance through pipes is at best clumsy; its emanations are injurious to health; its use affects somewhat our future supplies of coal; its manufacture is troublesome. As regards this latter point, inventors have endeavoured more or less successfully to produce machines whereby persons in detached houses may have the advantages of coal gas without the disagreeables attending its manufacture. Air is forced through some product of the distillation of mineral oils, and the resulting gas is burned.

Mineral oils are about as cheap as gas—about two and a-half gallons of petroleum are estimated to supply light equivalent to that produced by 1,000 cubic feet of ordinary coal gas. It is not, however, probable that mineral oils will supersede the use of gas. As to other sources of artificial light, magnesium is too costly at present to rival gas, and the dazzling brilliancy of its rays render its application very difficult for domestic use. Such is also the case at present with the lime light and the electric light. Recent experiments on the electric light, in which the carbon points have been used in nitrogen gas, afford some hope of a solution of part of the difficulties which have hitherto attended the electric light. But whether these experiments be successful or not, the broad fact remains that our present modes of obtaining artificial light are clumsy—the better we light our rooms the more poisonous do we render the atmosphere we breathe.

EXHIBITS AT THE SOCIAL SCIENCE CONGRESS, BRIGHTON.

MESSRS. PONTIFEX AND WOOD, of Shoe Lane, exhibit a Water Waste Preventer which deserves special notice, from the effective manner in which it acts, as well as the simplicity and ingenuity of the mechanism. The preventer is formed by a cylindrical receiver, which contains one gallon of water, a supply pipe being fixed at each end of it; inside the cylinder is a sliding bucket, which effectually closes the outlet when the proper quantity of water has been drawn off, either by lifting the handle of the W. C. or turning the tap of the lavatory, as the preventer is adapted to meet the requirements of each. The lifting of the plug sets alternately the up and down supply pipes in operation, and this drives the inner piston or sliding valve of the receiver either to ascend or descend, and the filling and emptying of the storage measuring reservoir proceeds simultaneously. No more than a gallon can be drawn off by one operation, although a less quantity can of course be taken.

In view of the very unnecessary waste of water, and the growing scarcity which is caused thereby, this apparatus deserves special attention. It is easily adjustable, simple in action, and not likely to get out of order, and the price is not a prohibitory one. In fact, were the system of water-rates made dependent on meters generally adopted, they would in a short time save their own cost. Messrs. Pontifex also exhibit some very convenient atmospheric pumps for cottage use, which combine great neatness with strength, portability, and cheapness. They are made in various sizes, at prices ranging from 13*s.* 6*d.* each. They also show a variety of high and low pressure taps of all dimensions, adapted to meet every requirement of hard usage.

MESSRS. ATKINS AND CO., of Fleet Street, have a well-assorted and well-arranged display of their various filtering and water-purifying appliances. Messrs. Atkins' name has become identified with the question of water-filtering and purification, which they have carried out in a most thorough manner—the various sizes and capacities of their filters ranging from the traveller's mouth-filter to those cistern-filters which are capable of furnishing pure water to a model lodging-house containing 700 inhabitants. The purifying material they use is carbon. The filters themselves are in every variety of shape and size, and at corresponding prices. The efficiency of their *spécialité* has been severely tested by chemical analysis, which showed that the organic impurities were reduced to the minutest quantity.

MESSRS. ALEXANDER VAN PRAAG AND CO. of 35, Crown Street, Soho, show a variety of convenient filters for domestic and travelling use. The latter are exceedingly light and portable, and the material of which they are made being compressed charcoal, they are at once effective in action and low in price. When Messrs. Van Praag claim, however, that their filters are the only effective and unerring water-purifiers to be depended on, and that they will last for three years in constant use, they claim too much, and forget the fact that carbon itself will become decarbonised by constant use.

MR. C. J. WOLLASTON, of 65, Westbourne Park Road, shows, under the title of Sanitary Carbon (we were not aware of any unsanitary carbon), a material possessing great disinfecting qualities, manufactured from the Black Stone of Devon. This material, which is a species of shale, contains a large amount of animal matter, which, when carbonised, forms a valuable disinfectant and filtering agent. The material has been subjected to severe tests, and appears to answer thoroughly its purpose of purifying and disinfecting any noisome compound. Being manufactured from an almost waste product, the price of the material is very moderate, and it certainly deserves to be more generally known.

MESSRS GIBBONS AND GREEN, sanitary engineers of Ipswich, exhibit a capital dry-earth or cinder closet, which is simple in action, easily adjusted, and of first-rate workmanship. The advantages which they very fairly claim are economy of cinder ash, so that no more can be used than is absolutely necessary; a complete and thorough absorption of urine, and consequent avoidance of any nuisance from that source, whilst the manurial value is fully preserved. Any description of material can be used with these closets,

either cinders, factory refuse, dry earth, gravel or sea-sand.

There will always be an objection to earth-closets from the necessity which exists of drying the earth, and this in wet weather becomes a heavy tax; with cinders, however, that difficulty is obviated. Messrs. Gibbons and Green make these closets of all sizes. The largest are fitted with all appliances, and form a garden tool-house, or large cupboard, which renders them specially suitable to the country gentleman's house, the price being 8*l.* 8*s.* Smaller ones are also made at a price suited to the cottager. One special feature is the addition of a duplicate sliding-seat, which renders them as suitable for children as for adults.

THE GOUX COMPANY, perhaps, are the only exhibitors who are prepared to undertake the disposal of the sewage of towns on a large scale, if we except Mr. Adam Scott, who exhibits working drawings and plans of Captain Liernur's pneumatic system.*

This, as far as England is concerned at present, is not a *fait accompli*. In our issue of November 28, 1874, we gave an illustrated description of the Goux Company's process, and our columns have, on many other occasions,† borne testimony to their excellent and very efficient process. There is, therefore, little more for us to add to what has already been well said before by Dr. Haviland and others who have given their experience of the practical working of the system. We may mention, however, that the company have been enabled to reduce the price of their absorbent material by the utilisation of what has hitherto been considered as almost a waste material.

The closet seats are also a model of neatness, cleanliness and cheapness. By an ingenious arrangement, a sliding, horizontal zinc screen covers all offensiveness from sight when the closet is not in use. The screen has an automatic action which is set in motion when the seat is in use. The cost of these apparatus certainly appears to be marvellously low, being only 35*s.* complete in all details.

The great errors which have been hitherto made by all and each advocate of a particular sewage system is, that one plan will apply to every town regardless of local conditions, and also that a large profit can be obtained from the manure. The Goux Company at Halifax and Aldershot have towns specially adapted to bring out these excellencies. The hilly nature of the former town would, in any water system, expose the dwellers in the elevated parts to the sewer gas which would rise from the low levels, as is the case at Newcastle-on-Tyne. Halifax and Aldershot are, moreover, situated in the centre of an agricultural district, so that a market for their manure surrounds them. Whereas, at a sea-side town they have but a semi-circle on which to dispose of their products. In very large towns again the company could not compete with advantage. Each of the various sewage systems, farming, precipitating, the Goux, and dry earth, have some special advantages which, under certain conditions render them peculiarly suited to some particular towns, and there are plenty of towns to allow each system to be advantageously adopted, and the Goux manager seems to be fully alive to this fact.

That the fertilising elements of sewage ought to be returned to the earth there cannot be two opinions. The wholesale waste of this valuable manure by the pollution of our rivers or the casting it forth into the sea is a national crime for which we ourselves are paying heavily already, and our posterity will have to pay still more if the practice is continued. Any system, therefore, which, like the Goux, has for its objects the utilisation of sewage to the utmost, indirectly tends to make two blades of grass grow where one only grew before, and deserves very careful consideration and encouragement.

MESSRS. TAYLOR AND CO., of Wakefield, exhibit one of those small articles of domestic economy, which, though apparently of little moment, still adds very much to the comfort and convenience of a household, and that is a patent system of fire-lighters. These are made chiefly from sawdust, compressed and amalgamated by some inflammable resinous compound. Each block will burn brightly for twenty minutes; and, as these fire-lighters tend to utilise to the utmost those substances which have nearly always been looked upon as waste material, they deserve to become a great success.

MESSRS. DIETZ AND CO., of Carter Lane, E.C., were, we believe, amongst the first manufacturers who turned their attention, practically, to the development of petroleum for lighting and heating purposes, and in so doing they achieved excellent results especially in view of the present and prospective price of coal and other fuel. Their patent paragon lamps will give a light of twenty-three sperm-candle power at a consumption of two ounces of petroleum per hour for seven to eight hours; this is more than 20 per cent. cheaper than coal-gas. There is no liability of the lamp getting out of order whatever; and there is also a perfect freedom from smell. These results have been fully tested by well qualified authorities at a competition of lamps. The combustion of fuel was so perfect that the lamp-glass was as bright after a fortnight's use as it was at first, and the cost of the light was reduced to a nominal sum. Another special lamp which they manufacture is the Hurricane Lamp, which, as its name implies, is specially adapted for outdoor use, no amount of swinging to and fro will affect the purity and steady brilliancy of the flame, or spill the oil. These lamps are specially made for hard wear, and their high illuminating power render them unequalled for outdoor purposes.

One purpose for which they are specially adapted is that of street lighting. There are many small towns which possess no gas-works, and there are other larger ones also which have 'struck' in consequence of the gas monopoly, which the local gas companies have abused beyond bearing. To such we would cordially commend Messrs. Dietz's system of street lighting.

The inventors also display an excellent assortment of heating stoves of all sizes, with adjustable cooking apparatus attached to each, according to their various capacities. These stoves can cook anything, from the bachelor's egg or chop to a leg of mutton with the necessary trimmings for a family. All these petroleum exhibits secure perfect combustion by means of an air-chamber, which allows the air to impinge upon the flame a second time, and thus secure the total consumption of all the products of combustion. The lamps and stoves are made in all sizes and in all manner of artistic decorations to suit

* See SANITARY RECORD, Nov., 1874, for detailed account of Captain Liernur's system of sewage.

† Vol. i. pp. 74, 391; vol. ii. pp. 154, 200, 284; and also Sept. 25.

the purses of all classes. Another great advantage which is introduced is that the lamps can be filled with petroleum whilst the consumption is going on, thus securing safety with ease in usage. We have noticed Messrs. Dietz's inventions before,* and can only reiterate the praise we there bestowed upon them.

MESSRS. ROBINS AND SON, of Brighton, exhibit—under the somewhat sensational title of 'High price of meat, and stoppage of the foreign supply'—Mr. Dickson's meat-preserving liquid. This fluid will, according to the certificate of Dr. W. Saunders, preserve meat for an unlimited period in all its native purity and freshness. Dr. Saunders also states that he had eaten a leg of mutton which had been preserved for upwards of two months, and that the fat and lean were deliciously tender, sweet, and wholesome. Any substance which will tend to economise meat at the present time, and in view of a still greater scarcity, deserves careful consideration. To butchers, hotel-keepers, and others, who at times have a large surplus stock of meat, and particularly in the hot weather, this liquid would be invaluable in preserving it from putrefaction and waste. The liquid is not, however, suitable for the preservation of meat on long voyages, and will not make one leg of mutton do the duty of two; the startling title, therefore, with which the high price of meat is associated with this liquid, and the stoppage of the foreign supply, is somewhat wide of the mark.

MESSRS. HANCOCKS, of Dudley, deserve more than a passing notice for the ingenuity and excellence of their various inventions. The most important of these is their patent root washer, which thoroughly removes all the dirt and the coarse outer skin or epidermis of the potato, however rough and irregular it may be in shape, leaving only the thin edible cuticle; this gives the double advantage of having the tuber 'boiled in its jacket,' or more properly, under-clothing, without giving the coarse earthy flavour incidental to that method of cooking, and effects, at the same time, a saving of about 50 per cent. in material and edible value of the root. The saving, according to the inventor, being 25 per cent. in the potatoe by the ordinary method of hand-peeling, and 25 per cent. loss arising from the fact that the larger portion of the farinaceous part is lost, as the most nutritious part of the potato is situated near to the outer skin of the bulb, the more watery and indigestible part in the centre. These machines are made of various sizes suited either for small families or large institutions. The amount of saving of time and nutriment they will effect would, in a very short time, speedily repay their own cost. Another of Messrs. Hancock's exhibits is their patent butter washing, pulping, potato-mashing, and juice-expressing machine, for the invention can be used for all these purposes. For the cleansing and purifying of butter the machine deserves to be more generally known. They also have a patent cinder-sifter, and an effective and simple sugar, bread, or spice-crusher or grinder, which will speedily granulate any material upon which it may be employed to the greatest degree of fineness. The size and prices of all the foregoing appliances are made to range from that adapted to a small family to a large institution.

MESSRS. ODAMS AND BLACKBURNE, of Fenchurch Street, E.C., exhibit the model of a new and improved form of solid sewage strainer, which they have named the patent rotary self-cleansing screen for sewage. The principle is that of an inclined revolving cylinder, through which the sewage flows. The cylinder itself consists of a double screen of wire gauze of different degrees of fineness, which effectually clear the water from all solid matters, and render it fit for treatment by precipitating, irrigation, or for discharge into the sea, or a tidal river not used for domestic purposes. We should take exception to the last clause of Messrs. Odams' description, as no sewage water should be allowed to mingle with any stream, tidal or otherwise, unless it be first thoroughly defecated. The inventors claim justly that by this invention a far greater amount of filtering power is obtainable than by any other solid sewage extractor in use at present. Whether the fine gauze wire, however, will stand constantly the enormous friction and wear of millions of gallons of sewage through it whilst being driven at a speed of twenty-five to thirty revolutions per minute, remains to be tested.

We have doubts on the subject ourselves. The fact, however, that Mr. Lewis Angell is about to use the machines in his new drainage scheme for Maidstone, and that they are shortly about to be used at West Ham and Bow creek is, however, a guarantee of its value. The name of Mr. Odams is so well known in connection with all matters relating to manures, that any invention relating to sewage which he may bring out deserves special attention. We believe a public trial of the screen is shortly to be made, and we reserve a further description until then.

MESSRS. COOPER AND CO., of 26, Oxford Street, have a choice assortment of tasteful medicaments, sweets, lozenges, pastilles, tooth powders, and other articles useful for health, comfort, and adornment. The special novelty, however, of their exhibit, is a pleasant form of effervescing astringent voice lozenges which dissolve slowly in the mouth with effervescence, and relieve the most intense thirst, whilst at the same time obviating the frequent desire for taking fluids. These lozenges can be carried in the waistcoat pocket, are always ready for use, agreeable and refreshing; they are perfectly harmless to the most delicate children. Clergymen, singers, public speakers, and many who have to tax their voice constantly, speak highly of the practical value of these lozenges.

* SANITARY RECORD, Dec. 26, 1874.

THE
SANITARY RECORD.
SATURDAY, OCTOBER 16, 1875.

MEAL TIMES.

III.

Dinner.

UNIVERSAL consent calls by this name the principal meal in the day, at whatever time it may be eaten; at least, between half-past eleven A.M., and half-past eleven P.M., the two extremes for which the writer's experience can vouch. The first example was on the banks of the Moselle, the last at home. Dinner is

the greatest physiological event between noon and midnight daily, and the circumstances of it are equal in importance with the material of it. The latter is too large a subject for a cursory discussion, and the present paper shall be confined to giving some hints on other arrangements which may contribute to the comfort of a few readers.

Dinner is necessarily a heavy meal compared with the others, and to receive it comfortably and without consequent inconvenience the stomach should be in the best condition it is capable of acquiring. There should be between work and the meal a certain period of repose, to allow time for the collection of a good store of gastric solvent, indicated by the phenomenon of a keen, healthy, vigorous appetite, such an appetite as stimulates mind and body to what in beasts of prey is rapaciousness, in men, a genuine joy at the sight, smell, and sound of food. If abstinence is extended too long the appetite is overstayed, and is succeeded by a listless ill-temper, which reason, rather than instinct, tells us will be relieved by food; and we fall to our meat growling instead of smiling. The consequence is imperfect secretion of gastric juice, and imperfect solution, especially of animal food.

It is a wise plan, therefore, if the appetite has been overstayed through the force of accidental untoward circumstances, to let the bulk of the meal be of vegetable materials, and more moderate than usual.

Young persons should not be allowed to fall into the lazy practice of omitting to dress for dinner. The short rest gained by this custom is of great value to themselves in middle life, and they will then appreciate the wisdom of those who enforced it. To sit down dusty and sweaty, sluttish and listless, spoils their own meal as much as it does that of others at table with them. This is intended to apply as much to the cottage as to the palace, as much to those whose only means of decoration are a rinse at the pump and a shake of the dusty coat, as to the wearers of low dresses and varnished boots. Its visible action on the health of the household is even the most marked in the case of its humbler followers.

Time should be allowed for these preliminaries by not fixing the dinner-hour too soon after the conclusion of business or active pleasure, too immediately after our sons have come in from their office, or our guests have arrived from a journey. However late either may be, let the dinner-hour be made proportionably later. Half-an-hour will probably be as much as can be required for this purpose; and such an interval has not the disadvantage of tempting to spoil the perfect condition of the recipient organs by premature use. If much more time, say an hour, has to be passed, people sometimes do themselves an injury by swallowing tea, sherry, and bitters, etc. The aqueous drinks over-dilute and wash away the gastric juice, and the alcoholic arrest its secretion.

A very common fault in dinner-eating is hurry. It causes the food to be swallowed half-chewed, and so to accumulate in a solid mass in the middle of the stomach. With this serious disadvantage of risking dyspepsia, there is not joined the advantage which it is to be presumed is aimed at, economy of time. For, in fact, more time is wasted by the consequent languor and incapacity than can possibly be saved by bolting the victuals.

If the time of dinner is fixed, as above said, by the time of the termination of active work, it will not be left to depend on the hour of the clock—a dependence which leads to much fallacious dogmatism on the subject. There are those who are governed apparently by the idea, that as children who dine at one are healthy and innocent, so health and innocence will bless their table also in proportion to the nearness to one o'clock of the hour when it is spread. There cannot be a greater mistake. Some of the worst cases of curable dyspepsia which the writer has seen have arisen from dining at one o'clock. At least they have rapidly yielded to treatment when the hour of the repast has been changed.

These people will argue that many very late diners are weakly and delicate, especially in respect of the digestive viscera. There is no doubt of the fact; but the reason is that late diners are apt to be late workers, and that it is too protracted toil from which they are mainly suffering.

Those, however, who have to rise early and consequently to go to bed early, must not dine too late, or they will have bad nights. At least three hours should intervene between the end of dinner and the beginning of the night's sleep. During unconsciousness the saliva ceases to be secreted; as may be known by the comparative dryness of mouth we feel on waking. And the same arrest takes place also, probably, in the gastric glands. So that unless enough of these solvents has been already formed to go on completing the chemical process, that has to be postponed till the next morning, and then no appetite for breakfast.

The order in which the materials of a dinner is taken is not a matter of such direct importance to their digestion as some seem to suppose. Herodotus wondered to see the tall jovial Persians in his day beginning their meal with fruits and sweets and several courses of vegetables; but they go on doing the same still after an experience of between two and three thousand years, without any obvious bad results to their joviality or development. The custom has survived changes of religion, changes of dynasty, changes of language, dress, weapons and occupation; so it cannot be an unnatural one. Fifty years ago it was common at boys' boarding-schools to begin dinner with sweet puddings or fruit pies. Malicious parents said this was done to keep down the butcher's bill, and so it was left off. But the boys did not dislike it, and seemed to thrive as well as they do now. The

writers of the Talmud seemed to take it for granted that the habit of beginning dinner with fish, common among the Jews of their day, would last to the end of the world; for the great feast of the elect people is to open with a slice of well-cooked leviathan. And, indeed, it seems generally assumed in England that is the right time for fish. Yet at country ordinaries on the Continent fish and crustacea, sweets, cheese and vegetables come in at all sorts of unexpected times during meals, and it is rather the quantity than the order which upsets the stomach. With the Romans eggs began a repast; with us they are nearly the last course. Now-a-days in Europe, if you do not have soup or fish sitting down, you may calculate on not seeing it at all. But at the table of a Chinese Amphitryon the stranger can never guess when it may not be introduced. In fact, physiology teaches us that all the courses are so churned up together in the stomach, that it cannot make any difference to the chemical solution in which order they are swallowed. It may be left to the taste of each individual diner to be as conservative or radical as he pleases in the arrangement of his carte, without risking the health of himself or his friends.

The order, however, of the gifts of Bacchus is a matter on which a few words may be said. If more than one form of fermented drink be taken, the less potent ought to be taken at the beginning, the stronger at the latter part of the meal. Alcohol, unless largely diluted, certainly arrests the perfect secretion of gastric juice. On an empty stomach it is fatal to digestion, on a full it is harmless; and there is every degree between the two results directly proportioned to the repletion. It is imperative to mention this, because modern butlers are so fond of insisting upon our drinking fiery sherry with our soup, and light claret after dinner, of giving us first curaçoa, and then iced-water, and otherwise poisoning us with impunity, that, unless we keep a sharp look out, we run a risk of indigestion undeserved and unavenged.

Of all times for drinking coffee, probably the most unseasonable is immediately after a heavy dinner. He whose viscera can stand that may assure himself that, whenever he suffers from indigestion, his pains are entirely the result of his own folly or obstinacy. Naturally he is constructed for enduring anything. And the injurious results of the coffee are increased by the addition of sugar and cream.

THE SOCIAL SCIENCE CONGRESS.

THE meeting this year at Brighton which has just been brought to an end, may on the whole be considered as being very successful. The general attendance at the meetings was small, much below the average of similar meetings elsewhere; but the cause of this paucity of attendance at the lectures is perhaps the less difficult to explain when the fine weather and the attractions of Brighton and its surroundings are taken into consideration. In fact, the visitors to Brighton laid themselves out for pleasure, and many of those who went to work remained to play.

Some dissatisfaction was expressed at the want of supervision, which was evinced in not having the papers edited and assigned to their due position before they were allowed to be read; the result of this want of supervision was that a prolix orator sometimes had possession of the platform, to the exclusion or undue curtailment of better material. Other papers which started apparently with the most genuine love of science, ended in a manner which reminded the audience strongly of the puff collateral or oblique, although of course disinterested, for some trade invention.

Notwithstanding these drawbacks, however, which the council have the power to remedy, the number of really valuable papers which were contributed was very considerable.

The exhibition of modern appliances partook, of course, more of the useful than the ornamental. It may be unhesitatingly pronounced to be a great success, not only from the number of exhibitors as from the number and ingenuity of their inventions and appliances.

We give in this issue a selection of some of the best papers in the Public Health Section, which we shall continue next week; and we also give a short critical notice on some of the more prominent and interesting exhibits.

Notes of the Week.

THE Parish of North Walsham has been constituted a Local Government District under sec. 272 of the Public Health Act, 1875.

At a public meeting in the Town Hall Chapel-en-le-Frith it has been decided by a very large majority to adopt the Local Government Act, 1858.

SMALL-POX WITHOUT VACCINATION.

A FRESH illustration of what ravages small-pox still makes where it is unchecked by vaccination is afforded in the last American Army Medical Report, in the description of Fort Shaw, Montana Territory; 'The Blackfeet nation of Indians, from December 2, 1869 to May 1, 1870, lost 1,400 out of a population of 7,000 or 8,000 by this disease.' They would have lost many more, but a part of the nation had already suffered from the disease. We commend this fact to those pestilent nuisances, the anti-vaccinators.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

AT the annual meeting, held in July last, the following officers were elected for the ensuing year.

Dr. G. Buchanan, President; Dr. Thomas Stevenson, Dr. G. Ross, Dr. F. T. Bond, Vice-Presidents; J. Liddell, Esq., Treasurer; Dr. J. Northcote Vinen, Dr. W. H. Corfield, Secretaries; Dr. J. Adams, Dr. C. O. Baylis,

Dr. M. Corner, Dr. T. O. Dudfield, Dr. C. B. Fox, E. L. Jacob, Esq., Dr. P. Jones, H. Leach, Esq., Dr. H. G. Sutton, Dr. C. M. Tidy, Dr. J. W. Tripe, Dr. W. T. G. Woodforde, Members of the Council.

SIMLA.

WE have reason to believe that Simla is to be abandoned, for some years at least. Simla has long been known as the chief sanitarium of the Government, and of the Presidency in which it is situated. The recent outbreak of cholera has, however, dealt the death-blow to a reputation which has been for many years declining. Successive medical officers have at frequent intervals for the last twenty years pointed out that official neglect and private greed were leading to the accumulation of conditions so unsanitary as to engender temporary unhealthiness, the sure forerunner of fatal epidemics. The warnings have been disregarded, but they are now fulfilled, and India is now robbed of one of its finest hill stations, of which but too few are available for the health of European residents.

SLAUGHTER-HOUSE LICENSES.

THE present month is one of considerable importance to sanitarians, as in it the magistrates of the several districts of the metropolis will sit in judgment on the slaughter-houses. These unsavoury establishments will have to be judged by the standard of the by-laws framed by the Metropolitan Board of Works ('Local Authority') and confirmed by the Local Government Board. We regret to observe that some of the vestries have yielded to the pretensions of the Local Authority and suffered themselves and their sanitary officials to be superseded, so that the licenses to many bad slaughter-houses—such as have no entrance other than through a shop or a dwelling-house, and those which have no pens for the cattle save in the slaughter-house itself—have been renewed in default of opposition. Happily there is one bright example of a different mode of treating this important question, and we congratulate the Kensington vestry on the stand they have taken in this matter, and which, we have no doubt, will be followed with equal success in other parishes. The vestry at the recent special sessions objected to both the classes of slaughter-houses referred to above as bad or objectionable; and the justices, notwithstanding the strenuous efforts of the solicitor to the Butchers' Protection Society, held that Dr. Dudfield, the medical officer of health, had proved his case, and that it was unlawful to use the slaughter-house as a lair (Dr. Dudfield contending that a lair in the slaughter-house is a part of the slaughter-house—that portion of the 'premises' which is not to be used for any other purpose than that for which it is licensed, viz. killing). They therefore required that separate and independent lairage should be provided before they would grant the license; and they also determined to view for themselves the six slaughter-houses which have no other entrance than the shop or the dwelling-house before renewing the license. We can hardly doubt what their decision will be; but should they, contrary to our hopes and anticipations, renew the license under such objectionable conditions, the responsibility will be theirs only, and their decision will not detract from the credit due to the vestry and to their medical officer of health.

ALDGATE PUMP.

THE friends of Aldgate pump have endeavoured to rehabilitate its fame by intimating that our charge against the water which it furnishes, as being polluted and unfit to drink, is made owing to error in the nomenclature of the pumps of the parish. This, however, is not the case. What may be the depth of filthiness of St. Botolph's pump, we cannot say. The handle has been taken away, and the spout broken. The water on which we last week reported as being filthily contaminated and dangerous water, heavily loaded with matter derived from sewage filtered imperfectly through the soil, was water drawn for the purpose of analysis, at the instance of the Rev. Mr. Barnett, vicar of St. Jude's, from the far-famed Aldgate pump itself, and no other than the 'Aldgate pump, *par excellence*, situated at the junction of Leadenhall and Fenchurch Streets.' It may be the opinion of its civic friends that 'against it no imputation can justly be made.' We regret, however, to state that their opinion is erroneous, and that we strongly dissuade them from backing their opinion by drinking the water. We have had the analysis repeated this week. As is the case with many well-waters, the contamination is various and fitful, depending upon the surrounding conditions of saturation of the soil, etc. This week the water is less filthy than it was when the sample of last week was taken. But this week, again, the analysis shows '10·1 grains per gallon of chlorine; 0·58 parts of free ammonia, and 0·11 parts of albuminoid ammonia. Water dirty and unfit to drink.' We must, therefore, repeat our suggestion that Aldgate pump be either abolished or furnished with a pure water-supply. It is a standing danger to the water-drinkers who resort to it, and the danger is the greater because the water is particularly cool and palatable, and enjoys so high a reputation that many persons send for it at times of illness, or when they desire to refresh themselves with a glass of cool spring-water. We should add that the stand-pipe erected by the side of St. Botolph's pump gives water which proves on analysis to be quite good and wholesome.

BOAT RAISING AND LOWERING.

THOSE who take note of nautical affairs, and know how many lives are annually lost in the comparatively simple operations of raising and lowering boats over ships' sides, will be glad to learn that effectual means are being taken to prevent such calamities in future. Mr. Hedley, of Cubitt Town, Isle of Dogs, has just taken out a patent for a new contrivance which promises to be most effectual in this direction. The apparatus, which it is somewhat difficult to describe clearly without diagrams, is to be worked by hydraulic power. This arrangement is quite unique, and it permits of *one man* raising a boat or a steam launch from the water, or depositing it therein from the deck of a ship. The main features of Hedley's scheme consist of two barrels of metal one within the other, and the inner one of which is free to swing or turn on a pivot. These are sunk below the deck of the ship in which they are placed. The upper end of the inner barrel carries standards of iron to which a rock beam or double ended lever is hung by trunnions. From this lever is suspended the gearing by which the boat is to be attached. By simply keeping a charge of water between the two barrels under pressure of a hand pump a reservoir of power constantly exists, and by shutting one valve and opening another a boat may be lifted, or the crane holding it be swung round, at the will of a single sailor. Thus the apparatus is automatic, and only requires guiding, as it were, in its performance of its required duty. Mr. Hedley proposes that boats and launches should be carried on seatings placed athwart the ship, and not fore and aft as is usual now. By such a plan boats would be deposited in the water stern on to the ship's side, and prevented being swamped by being drawn close to the ship, and caught fatally by the first wave—as at present. This permits of the oars being plied from both sides of the boat at once—an obvious advantage. We understand that Mr. Hedley is in communication with the Prince of Leiningen as to the adoption of his plans in the Navy, and also is designing a disengaging hook or catch for the ready attachment or detachment of boats and steam launches. It is due to the same gentleman that the last named craft came into existence at all, for he devised and started one on the Tweed as a passenger boat, thirty odd years ago. At this moment steam launches exist on almost every navigable river at home and abroad.

THE HASTINGS WATER-SUPPLY.

A YEAR and a half ago it was pretty generally acknowledged that the water-supply of this borough was defective, at any rate in quantity, and the result of a local discussion, not to say warfare, on the subject, was an additional source of supply being found in some springs at Fairlight, and a successful new boring at Hollington. For a time the supply was thus rendered somewhat more nearly equal to the requirements of Hastings and St. Leonards. The relief was, however, only temporary, and between the constantly increasing demand for water, and the deterioration of its quality from the encroachment of building operations in the immediate neighbourhood of some of the sources of supply, rendering it desirable that they should be closed, the water question has again locally assumed the prominence it deserves. In order to be in a position to decide upon the best method for dealing with this question the Town Council commissioned Mr. W. Topley, C.E., F.G.S., to inquire into and to report upon 'the geological questions relating to the existing supply of water to Hastings, and to consider how that supply may best be augmented or superseded.' Mr. Topley's report has recently been presented to the Town Council. Space forbids that we should follow Mr. Topley through his elaborate report, in which he carefully discusses all the various methods by which the present insufficient supply may be supplemented. The several propositions to deepen the present wells, to increase their supply by means of headings or galleries, or to sink new wells in their vicinity, are all considered in detail; but the ultimate result to be expected from any of these expedients is not described in at all confident terms, although Mr. Topley says that the two latter might be worth trial, especially as the expense would be small. With regard to deepening the present wells Mr. Topley gives an adverse opinion, and, as regards sinking new wells, very little confidence is expressed as to the amount of water to be obtained from wells in the Wealden strata, as it is stated that they never yield a large supply. It is recommended, however, that water should, if possible, be obtained from the lower greensand formation. Eastbourne is now supplied by a well and headings in the lower greensand. Water from this formation is always far softer than that obtained from the chalk, and this is an undoubted advantage. The two spots most recommended for sinking wells to this formation are Glynde and Sherman's Bridge, near Berwick, which are, however, twenty-one and a half and sixteen and a half miles from Hastings. In a summary Mr. Topley says that there is little doubt but that the present sources of the water-supply of Hastings might be increased by extending the existing wells, or by sinking new ones in the immediate vicinity of the town, but that it will be probably necessary before long to seek for a distinct source for future supply, unless a complete success should result from the experimental deep boring now in progress at Netherfield, which, however, Mr. Topley does not anticipate. As to the quantity required, the report says, 'It would be wise to provide for possible increased consumption, as well as for certain increase of population; a population of 50,000, at thirty gallons per head, would require a million and a half gallons per day.'

There can no longer be any reason for further delay in the settlement of the water question in Hastings, on the ground of want of information on the subject. That this settlement will entail a considerable expense it is impossible to doubt, but the outlay will be a thoroughly remunerative one, if it only remove the charges which have long been made against this watering-place, that its water-supply is very deficient in quantity, and that the sources of a portion of it are not free from suspicion. The validity of these charges appear to be fully admitted, and yet strange to say, notwithstanding an increasing appreciation of the value of sanitary reputation on the part of the Town Council, the water question has been treated by them with unusual apathy. Scarcity of water is a drawback anywhere, and a water-supply which is even in part dependent upon surface springs or wells, especially in porous soils near to towns, which a few years ago abounded in cesspools, is positively dangerous. Seaside visitors are beginning to be critical in the matter of water-supply, and every year the necessity for caution as to its source becomes more apparent to all those who think on the subject.

Law Reports.

SANITARY NEGLECT IN CLERKENWELL.

AN inquest has been held by Dr. Hardwicke on the body of Sarah Ann Smith, aged seventy-five. The deceased, though subject to epilepsy, went out daily to attend a blind woman eighty-seven years of age, named Gibbons. While so engaged on Saturday, Mrs. Smith was seized with a fit and died. The body had, at the time of the inquest, been three days and nights in the same room with old Mrs. Gibbons, a room which measured ten feet square. The coroner and jury expressed their horror, and the relieving officer said he would report the case to the guardians, a statement that was received with cries of 'Oh,' and laughter. The relieving officer stated that there was no place at the workhouse for the reception of the dead of the out-door poor; those who died in the workhouse were put in an old carpenter's shop until they were buried. The coroner remarked that he could not express his feelings of disgust at the manner in which sanitary matters were neglected in Clerkenwell. No attention was paid to the representations of juries, and his only hope was in the press taking up the subject. Ultimately the jury drew up a strong remonstrance to the vestry, which the coroner promised to forward.

A VACCINATION MARTYR.

AT Highgate Police Court, Mr. R. Pitman, 23A, Woodstock Road, has appeared in answer to two summonses taken out by the vaccination officer of the Edmonton Guardians, charging him with having neglected to have his two children vaccinated.—The defendant said the Act required the bench to fine him if he did not prove reasonable excuse, and he proceeded to quote from statistics drawn up at Birmingham to show that of the deaths from small-pox there, a year or two ago, 6,795 were persons who had been vaccinated, against 830 who had not been vaccinated. This was his first excuse. His second was that a return to the House of Commons—Mr. Bodkin (interposing): That may satisfy you, but it does not satisfy the Act of Parliament. It is nonsense to argue in this way in the face of an Act of Parliament. The defendant quoted from the return to the House of Commons to show that since vaccination had been made compulsory the deaths amongst children under five years of age were 529,000 in excess of those before. His third excuse was that he had no right to poison his children, who were given to him by God, and not by the Legislature. Therefore he asked the bench to fine him as lightly as possible. He had not had the children vaccinated, and he would not undertake to have it done.—Mr. Bodkin ordered him to pay the full penalty of 20s. and costs in each case.

DEFECTIVE NOTICES.

SAMUEL PITTS, of Fulshaw, has been summoned by the Altrincham rural authority, that he being the owner of certain property in Fulshaw, permitted the pollution of a certain brook called Black Brook, by the sewage from the said property. The clerk then read a notice, a copy of which the inspector said had been served on the defendant. Mr. Pitts, however, on hearing it read, said that the notice he received was quite different from that read. The Clerk: Then the service of the notice must be proved. Mr. Pitts requested the clerk to compare the notice sworn

to as having been served on him in Manchester, with that he now produced, which was done; it was evident that they were entirely different notices. Mr. Pitts then examined the inspector's assistant as to his reason for serving him at his business place in Manchester with a notice bearing on a matter concerning his property in Fulshaw, where he resided. The assistant replied that he was told to serve it at his place of business in Manchester. Mr. Pitts: I distinctly say I have not received the notice sworn to by this young man as having been served on me at my place in Manchester. I have no notice but this (producing a different notice). The Clerk: Then the service of the notice is not proved. Mr. Gaskell: Do you object to allow the case to go on because the notice is not proved; they will serve you with another notice. Mr. Pitts: Decidedly I do; I have come to defend this notice. I may be as well prepared to defend the other notice when I get it. The Clerk: The case must be dismissed then; the service of the notice is not proved.

POWERS OF INSPECTORS.

SIR,—In the SANITARY RECORD, of September 25, is a letter from an inspector of nuisances of a rural authority asking advice respecting dilapidated houses—unoccupied and contiguous to highways—and what power of interference he has to remedy the evil.

The reply annexed thereto appears to me to be not sufficiently explicit, and not quite correct. If you will kindly allow me to say a few words on the subject I shall be glad, especially as it affects the duties of sanitary inspectors.

By the definition Clause 4 of the 'Public Health Act,' it states 'the word surveyor shall include any person appointed by a rural authority *only* to perform the duties of surveyor under the Act.' It gives no power whatever to a sanitary inspector of an urban authority, the power of interference being left entirely with the surveyor, by the 'Towns Improvement Act,' section 75, which is incorporated for urban authorities only.

Therefore an inspector of nuisances in either case has, I apprehend, no power of interference with uninhabited buildings in a ruinous or dangerous condition contiguous to highways. Surely this is an oversight in framing the 'Public Health Act, 1875!'

JOB HEATH APTED,
Inspector of Nuisances for Reigate
Oct. 12, 1875. Borough Urban Authority.

Correspondence.

[We do not necessarily endorse the opinions of our correspondents by the publication of their letters.]

UNWHOLESOME FOUNDATIONS.

(*To the Editor of the* SANITARY RECORD.)

SIR,—I perceive, from the letter of 'M. P.,' at p. 227, that my letter, at p. 209, has been somewhat misunderstood. I did not intend to suggest that those who propose to build on sites suspected to be unwholesome should be left to decide whether it is safe to do so or not; but, that it should not be assumed such sites must be unwholesome merely because at some previous time they have been foul, without some such examination as that I suggested, proving that they still are so, for almost every site has at some time been foul.

As to the supposed danger of using street-sweepings for gardens, I may say I have tried them for the purpose, and one of my objections to their use is, not that they contain too much, but too little fertilising matter. I have known large burial-grounds covered with slop from macadamised streets making a disgusting looking mess, highly improper as a matter of taste and sentiment, but quite harmless as regards health; as may, perhaps, prove to be the case with the garden at Euston Square, unjust as the contractor's conduct seems to have been, unless the report of it has been much exaggerated, as is not unlikely and is so very frequently the case.

Of course, it is not certain that if the air above soil suspected to be still foul is not sensibly impure, that it is perfectly free from septic poison, but it is almost certain that it is so; and it is unjust to prevent anyone making what use he pleases of his land, simply because it is barely possible that the proposed use of it may be unsafe, without making any effort to show that it is so. Such unreasonable prohibitions are sure to be, and ought to be, resisted. Those who seek to render sanitary improvement acceptable and accepted, must carefully avoid unreasonable requirements to guard against just possible but improbable and unproved dangers.

P. H. HOLLAND.

THE GOUX SYSTEM.

(*To the Editor of the* SANITARY RECORD.)

Mr. A. Haviland, in his letter on what he queerly calls 'the Goux system of the disposal of our sewage,' gives no hint how what is commonly and properly called so, *i.e.*, the liquid conveyed by sewers, is to be disposed of in places where this system for disposing of night-soil is adopted. Nor does he give any reply to the ordinary objection to the adoption of any such system, that it leaves the difficulty of disposing of real sewage itself untouched, in some cases increased, by lessening the manurial value of the foul liquid, which will not be allowed to continue polluting the streams into which it has hitherto been made to flow. In several towns where water-closets have not been introduced, or only to a very limited extent, injunctions prohibiting the pollution of rivers by sewage have been obtained, and would not be dissolved if the use of water-closets were entirely abandoned, as they never will be by those who have experienced the comfort, safety, and convenience of being enabled to get rid of filth immediately and completely, who will never be persuaded to adopt any scheme for its retention in or near their houses by the hope, even if it were a well founded one, of making a profit of 1*l.* a year, or not a penny a day by its sale. In places without sewers or water-supply, such a system may possibly deserve support, but in substitution for water-closets, where those conveniences, those great promoters of civilisation are practicable, all such schemes are wild indeed; except perhaps as a temporary expedient, while local authorities are undergoing the sanitary education of which those stand very much in need who propose any such scheme for permanent adoption, except for country places with gardens or fields close at hand. For these there is perhaps no better plan than placing in each privy a box full of dry garden mould, ready to throw upon the excrement directly it is received into a large pail under the seat, to be emptied when full, and used as manure for a field or garden; a plan in successful operation long before earth closets were heard of, which was perhaps originally suggested by a pussy-cat, who possibly inherited the plan from some pre-adamite progenitor. The first human adopter of the use of earth as a disinfector of excrement is unknown; it was enjoined by Moses, but very likely was in use before his time; there is therefore no patent to be infringed if the mere design of anyone's earth closet be not copied, and there is none worth copying, for a mere scoop does all that is needed for throwing on the earth as well as the best of them, and the best is not nearly so good, so safe, and so convenient as a well-made water-closet, when one can be had without a cesspool, and with a proper supply of water. Any plan for the removal of night-soil only, and not for all the filth of a town, is a mere makeshift.

H. H. P.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

BARNETT, Mr. Edward, has been appointed Inspector of Nuisances for the Bakewell Rural Sanitary District, and the Baslow, Bubnell, North Darley, and South Darley Urban Sanitary Districts.

BOASE, Francis, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Penzance Urban Sanitary District.

FARRINGTON, James, has been re-appointed Inspector of Nuisances to the Fylde Union Rural Sanitary Authority at an increased salary.

FENTEM, Philip Sheldon, M.D. Univ. Edin., M.R.C.S. Eng., has been appointed Medical Officer of Health for the Northern Division of the Bakewell Rural, and the Baslow and Bubnell Urban Sanitary Districts.

HAMMOND, Robert Edward, L.R.C.P. Lond., M.R.C.S. Eng., has been appointed Medical Officer of Health for the Gorton Urban Sanitary District: 40*l.* for one year.

HARRIS, James Alfred, M.D. Univ. Lond., M.R.C.S. Eng., has been appointed Medical Officer of Health for the Chorley Rural Sanitary District, vice Rigby, resigned: 150*l.* per annum.

HINGSTON, Alfred, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Liskeard Urban Sanitary District: 20*l.* per annum.

KNOX, John, M.D. Aberd., L.R.C.S. Edin., has been appointed Medical Officer of Health for the Southern Division of the Bakewell Rural, and the Bakewell, Matlock, North Darley, and South Darley, Urban Sanitary Districts.

LEGGATT, Mr. William, has been re-appointed Inspector of Nuisances for the Wells, Norfolk, Urban and Port Sanitary Districts.

PATERSON, William, M.D. Univ. Glasg., has been appointed Certifying Factory Surgeon for Chorley, vice Rigby, resigned.

SCOBELL, Thomas Edward, M.R.C.S. Eng., has been appointed Medical Officer of Health for the Ivybridge Urban Sanitary District.

VICKERS, Mr. Thomas, has been appointed Inspector of Nuisances for the Moss-side Urban Sanitary District, vice Thrustle resigned.

VACANCIES.

BALSALL HEATH URBAN SANITARY DISTRICT. Inspector of Nuisances and Assistant Surveyor.

BEDLINGTONSHIRE URBAN SANITARY DISTRICT. Surveyor and Inspector of Nuisances: 150*l.* per annum. Collector: 100*l.* per annum. Applications, 20th instant, to George Jeffrey, Clerk to the Authority, Morpeth.

CHATTERIS URBAN SANITARY DISTRICT. Medical Officer of Health.

DENBIGH URBAN SANITARY DISTRICT. Inspector of Nuisances.

FLEETWOOD URBAN SANITARY DISTRICT. Surveyor: Application, 29th instant, to William Ascroft, Clerk to the Authority.

GARSTON URBAN SANITARY DISTRICT. Surveyor: 200*l.* per annum. Application, 18th instant to the Chairman of the Authority.

NORTH WITCHFORD RURAL SANITARY DISTRICT. Medical Officer of Health.

RAMSGATE URBAN SANITARY AUTHORITY. Surveyor and Inspector of Nuisances.

SEVENOAKS URBAN SANITARY DISTRICT. Surveyor; 150*l.* per annum. Application, 31st instant, to G. F. Carnell, Clerk to the Authority.

SLIGO URBAN SANITARY DISTRICT. Medical Officer of Health.

ST. GILES AND ST. GEORGE DISTRICT. Medical Officer of Health: 150*l.* per annum. Application, 23rd instant, to J. Henry Jones, Clerk to the Board of Works, 199 Holborn.

SANITARY PATENTS.

2936. Improvements in apparatus for cooking alimentary substances. Henry Edward Newton, Chancery Lane, London.—A communication from Lucien Albert Marie Helie, Paris.

2960. Improvements in the manufacture of manure, and in the apparatus employed therein. John Henry Johnson, Lincoln's Inn Fields, London.—A communication from Henri Prosper Ollivier Lissagaray, Pantin, near Paris.

2974. An improved life-saving, swimming, and bathing garment. Charles Crisp, Eastbourne, Sussex.

3001. Improvements in traps for basins, sinks, and the like. William Robert Lake, Southampton Buildings, London.—A communication from Frederick Adee, Brookly, New York, U.S.

3026. Improvements in churns and washing-machines. Thomas Green, Smithfield Ironworks, Leeds, Yorkshire, and Joseph Housley Place, Harrogate, Yorkshire.

2687. Collecting and treating human excrement, etc. Bridge Baron Standen, Langdon Terrace, Blackheath, Kent.

2732. Automatic Couplings. William Stableford, Oldbury, near Birmingham.

2683. Deodorising apparatus. Millington Henry Synge, United Service Club, Pall Mall, London.

1625. Filtering, etc., sewage. Thomas Pape, Great Alfred Street, Nottingham.

1693. Ventilating, etc., cover for water-closets, etc. Michel Alexandrovitch Popoff, Priajka, St. Petersburg, Russia.

3063. Clearing the vents or discharge-pipes of wash-basins, etc. Alexander Melville Clark, Chancery Lane, London.—A communication from John Savage Hawley.

ABSTRACTS OF SPECIFICATIONS.

988. Soap. S. S. Lewis, Boston, Massachusetts, and A. Copie, London.

The said invention relates to the mode of and means for improving the qualities and decreasing the cost of hard, soft, and toilet soaps. The inventors dissolve ordinary soap, and mix with the solution china clay or other ingredient. They use this compound as a vehicle or body to hold the chemicals, and also add to the compound a portion of '*poudre de savon de palm.*' They add perfume when the compound is cooling for the toilet soap in the usual manner. The detergent or cleansing property of this soap is the silicate of soda.

527. Ventilating carriages, ships, buildings, and sewers. T. Atkins, St. Albans.

This invention relates to improvements in the arrangement and construction of apparatus for ventilating railway and other carriages, ships, buildings, warehouses, and drains or sewers. For this purpose cones or conical air passages are employed, either of metal or other material. The mouth or entrance to the cones or passages should offer about three times the surface of the centre, and the cross passage for effecting ventilation should be one-sixth of the surface of the mouth or entrance to the cones or air passages. By the arrangement and construction of this apparatus a cross current of air is produced. A tongue or valve is placed or arranged near the centre of the cone, which valve may be suspended from two centres. The air is forced through the cross aperture into the apartment or place to be ventilated. A movable valve is fixed in the cross-piece for regulating and adjusting the exact quantity of air required in the apartment or place to be ventilated. Chimney cowls are arranged with a movable cone and valve, which is always presented to the wind, thus producing a constant vacuum in the chimney. The current of air entering a ship or other place to be ventilated may be caused to pass through coarse canvas, felt, cotton, or other evaporative materials, kept damp for the purpose, by which means any required degree of temperature may be secured, or the air may be caused to pass through compounded carbon, composed of mineral, animal, and vegetable charcoal.

531. Gas for heating or other purposes. J. Kidd, Dartmouth Street, Westminster.

This invention consists essentially in the generation of a mixture of carbonic oxide, hydrogen, and carburetted hydrogen gases from peat or wood charcoal or mixtures of the same, or from high-dried or charred peat either alone or mixed with other solid fuel, contained in a closed chamber, and kept in a state of incandescence below by a jet of air and steam, the external atmosphere being entirely excluded.

614. Heating and cooking. S. Leobl, Aldermanbury, London.

A gas pipe communicates with a stove, the flow of gas being intercepted by a cock or valve worked by a movable gas pipe forming a tubular lever or arm, and which when pressed on by the tool or article to be heated brings its flame to the stove and ignites the gas which it allows to flow thereto from the first-named pipe.

545. Improving the draught of chimneys. C. H. Turner, Great Winchester Street.

This said invention relates to a new and simple apparatus to be placed in a chimney to insure the maintenance of a proper and regular draught through the same and to prevent its smoking, no matter what may be the direction or force of the wind or the condition of the atmosphere.

OPEN CONTRACTS FOR SANITARY WORK.

THE Newport and Pillgwenlly Water Works Company require 12,000 tons cast iron pipes, 15 inches diameter. Specifications and forms of tender to be had from Mr. John Taylor, 27 Great George Street, S.W.

The Canterbury Bath Company require tenders for the construction of a new swimming bath. Plans and specifications at Mr. John Green, the architect's office, 8 St. Margaret, Street, Canterbury. Tenders must be sent by the 19th inst.

The Douglas Aquarium and Baths Company require tenders for the substructure of baths. Specifications, etc., price 21*s.*, of Mr. Pons, architect, 41 John Dalton Street, Manchester, or of Messrs. Speakman & Hickson, architects, 23 St. Anne's Street, Manchester.

The Hastings and St. Leonard's Aquarium and Baths Company require tenders for the erection of the buildings. Specifications and details can be seen at Messrs. Jeffrey, Skiller & Co., 96, Great Russell Street, Bloomsbury, and 5, Havelock Road, Hastings. Tenders not later than the 18th inst., to the Secretary, 23, Havelock Road, Hastings.

The Evesham Town Council and Sanitary Authority require tenders for the construction of pipe sewers, sewage tanks, turbine house, man-holes, ventilators, etc., and for the drainage of the town. Drawings, specifications, etc., at Messrs. Gotto & Beesley's. Tenders to Mr. Thomas Cox, Town Clerk, Evesham, by the 16th instant.

The Abingdon Town Council require tenders for the works of sewerage and sewage disposal. Drawings and conditions at the office of Messrs. Baily, Denton & Co., 2*l.* 12*s.* 6*d.* Tender to Mr. Dan Godfrey, town clerk, due by 22nd instant.

The Eastbourne Local Board advertise for tenders for laying down about 750 yards of brick sewer and constructing a catch pit. Plans, etc., at the Surveyor's office, Meads Road. Tender to Chas. Tomes, surveyor, Eastbourne. October 13.

The Wombwell Local Board require tenders for the construction of two reservoirs and other works. Mr. J. Robinson, Clerk to the Board, Park Cottage, Wombwell. October 16.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer —not necessarily for publication.

GUIGNET'S GREEN.

ANY pigment which approaches in beauty the fearfully poisonous Paris green certainly deserves attention. The *Scientific American* says, one of these is said to be an hydrated oxide of chromium, prepared in a peculiar manner and known as Guignet's green. We doubt the statement that it is not poisonous: but it is, at all events, far more harmless than Paris green, or any other arsenical colour. It is prepared on a large scale by fusing together, on the hearth of a suitably constructed flame furnace, at a dark red heat, three parts boracic acid to one part bichromate of potash. The mass swells up, much oxygen gas is evolved, and the substance is finally converted into a beautiful green double salt, a borate of chromium and potash. By repeated washing with boiling water, it is decomposed with hydrated oxide of chromium and a soluble borate of potash. After suitable washing and very fine grinding, this oxide of chromium has a most beautiful shade of colour, covers well, stands the air and light, and is only attacked by boiling concentrated acids. On a small scale, this green pigment may be prepared in a porcelain crucible.

COFFEE AS A DEODORISER.

IT is not generally known that coffee has the property of rendering animal and vegetable effluvia harmless, and, indeed, of destroying them. The following facts refer only to dry and fresh-roasted coffee, but if its efficacy in that form be established, it would furnish a presumption in its favour. A room in which meat in an advanced state of decomposition had been kept some time was instantly deprived of all smell on an open coffee-roaster being carried through it containing one pound of coffee newly roasted. In another room, exposed to the effluvium occasioned by the clearing out of a dung-pit, so that sulphuretted hydrogen and ammonia in great quantity could be chemically diluted, the stench was removed within half a minute, on the emptying of three ounces of fresh-roasted coffee; whilst the other parts of the house were permanently cleared of the same smell by being traversed simply with a coffee-roaster, although the clearing of the dung-pit took several hours longer. Even the smell of musk and castoreum, which cannot be overcome by any other substance, is completely dispelled by the fumes of coffee; the same applies to assafœtida. A good plan is to carry the unroasted coffee-berries on a hot shovel where a coffee-roaster is not kept.

HEAT OF RAILWAY CARRIAGES.

The *Lancet* says that one of the many discomforts incidental to travelling during the hot season is the intolerable heat of the railway carriages, and the railway companies seem to do their utmost to increase it. We entered a carriage at Charing Cross Station this summer. It had evidently been standing for some time in the sun, for the wood was almost too hot to touch. The roof was black and dull—the best possible surface for absorbing heat,—and both windows were shut. It was like entering a baker's oven, and we fled precipitately to a third class carriage, where the temperature was, at any rate, some degrees below blood heat. In some conditions of body it would be highly unsafe to travel in such a carriage, and when we consider the ease with which the evil might be lessened, we are amazed that even railway officials do nothing in the matter. A false roof a few inches above the true one, painted white, and permitting the free passage of air below, would make a wonderful difference, and would be an advantage both in summer and winter. If any contrivance could be added which should allow the windows to be opened without giving entry to a cloud of dust, railway carriages might become positively comfortable, and some of the longing for State management of railways averted.

VENTILATION OF RAILWAY CARRIAGES.

A TEST was recently made on the Michigan Central Railroad of a method of ventilating passenger cars, of which Messrs. Winchell, Durham and Co., of Chicago, are the proprietors. The trial was made with a car built by this firm for the express purpose of exhibiting and testing the merits of this particular method of ventilation, and the results are reported as very satisfactory. A number of prominent railroad men were present on the occasion and witnessed the experiments. The arrangement consists of an air-chamber extending the entire length of the deck or dome of the car roof. This chamber is of the same width as the deck, and about four inches deep, and has at each end a hood about six feet long and eighteen inches deep, the mouth of which is covered with fine wire gauze. In each hood is a cut-off for regulating the quantity of air admitted, and which can be operated by a rod from the inside of the car. Registers are placed along the bottom of the air-chamber for admitting the air into the car, and are always kept open. In summer the forward cut-off is kept open and the rear one closed. A current of air, when the train is moving, is thus constantly forced through the netting into the chamber, and through the registers into the car. The registers being directly over the centre of the aisle, the passengers are not annoyed by the draught. In winter the front cut-off is closed and the rear one opened, the air-chamber then acting as an exhaust—sufficient fresh air being supplied from other sources. The condition of the car thus ventilated, as compared with the others of the same train, showed that the device worked well. There was no annoyance from cinders, and the cigar smoke passed directly from the smoker's lips to the windows and out of the car. As it rained during most of the trip, there was no dust: the deflectors kept the rain from coming in at the windows, and the cinders that were seen adhering to the outside of the wet deflectors showed how very well they were intercepted.

OPIUM-EATING.

THE opium-eater gets into his fairy-boat, and drifts out upon the bosom of a lovely stream. The surface of the clear water is unbroken by a single ripple. The pleasant surroundings and soothing motion of the boat invite him to sleep. So he makes himself comfortable, and glides over the land of dreams as smoothly as the little boat glides over the bosom of the stream.

His sleep is delicious and his dreams enchanting, but, ere long, he is aroused from his sweet slumber by the sound of rushing water.

'Ha! it is the cataract. I'm lost!'

He jumps to the oars, and pulls with almost superhuman strength. For a while he holds the boat against the stream, but soon his arms grow weaker, and the little boat drifts on with the hurrying waters, and the despairing victim who occupies it is whirled over the rocks into eternity.

After the opium habit has become firmly fixed, can it be relinquished by the exclusive efforts of the victim?

From the despairing multitude of opium-eaters comes the solemn answer—*never*.

BORACIC ACID AS AN ANTISEPTIC.

In a series of articles on 'Recent Improvements in the Details of Antiseptic Surgery,' publishing in the *Lancet*, Prof. Lister, F.R.S., gives an interesting account of his acquaintance with boracic acid. About three years ago Dr. Stang, of Sorweg, in Norway, being on a visit to Edinburgh, informed the Professor that a new antiseptic had been discovered in Sweden, and was extensively used in that country for the preservation of articles of food, and also as an application to wounds. The 'aseptin,' as it was termed, was in two forms, a powder and a liquid, the latter receiving the additional title of 'amykos.' On returning home, Dr. Stang sent samples, at the same time stating that the active principle of both the articles had been ascertained to be boracic acid, the virtues of which had been discovered by Mr. Gahn, a chemist in Upsala.

Trying them on himself, he found both the new antiseptics, when employed in the form of watery solution, highly efficient and much less irritating than carbolic acid.

Boracic acid was then little more than a chemical curiosity. But he succeeded in obtaining in Edinburgh a sufficient quantity to enable him to test its properties unmixed with other ingredients. Some striking instances of its antiseptic efficacy as well as of its therapeutic value were soon witnessed, and now the solution, as well as boracic lint and other preparations, are being extensively used.

SUNFLOWERS AS DISINFECTANTS.

MR. T. SERLE JERROLD writes to point out the great merits which sunflowers possess as disinfectants.

He states that the subject received some attention about three years ago by General Sherman, who utilised this plant in the purification of the pestilential marshes around Rome. The General said, 'To make such places healthy, we just sow them with common sunflower-seed, and that does it.' My own experience points to the same conclusion. Taking up the cultivation of the sunflower a few years ago, my attention was forcibly drawn to the subject of its extensive cultivation having a markedly beneficial effect on the surrounding atmosphere, by the fact that one season the village near which I resided was visited by a severe epidemic of scarlet fever and typhus; many children died, one in a cottage where the whole family was prostrate at one time, not a hundred yards from my own house. All my family escaped without a touch of sickness. I had at that time about sixty very large sunflower plants in my garden surrounding the house, many of them being twelve feet high. My personal experience of the efficiency of the cultivation of the sunflower as a preventive of miasmatic fever has been fully borne out by other and worthier authorities, of whom General Sherman is one. A landowner on the banks of the Scheldt sowed the sunflower extensively on his property near the river, with such effect that there has not been a single case of miasmatic fever among his tenants for years, although the disease continues to prevail in the neighbourhood. The *savants* of France, Italy, and Germany, believe the cultivation of the sunflower to be effectual in removing the sources of disease.

It may not be generally known that the sunflower absorbs during its growth a vast quantity of impure gases, it feeds largely by its leaves, absorbs nitrogen more rapidly than any other plant, and will evaporate as much as a quart of water daily. I am convinced that the cultivation of this much-neglected plant on a larger scale would not only be beneficial, but remunerative. The fibre can be used for making paper; the ripe seed is most useful as food for poultry, especially during the moulting season; from it a fine oil—second only to olive—is extracted; the leaves are much relished by rabbits; and the thick stems may be used as fuel.

EARTH TO EARTH.—The superiority of the London Necropolis (Woking Cemetery) has been specially recognised in the *Times*, and other leading journals, and it is admitted that here only can the burial of the dead be properly carried out. The Company is prepared to conduct Funerals without the intervention of the ordinary undertaker at any stage of the proceedings. Prospectus free.—Office, 2 Lancaster Place, Strand, W.C.

NOTICE.

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Social Science Congress.

MEETING AT BRIGHTON, 1875.

HEALTH SECTION.

ON NATIONAL VITALITY.

BY DR. RICHARDSON, F.R.S.

THE lecturer glanced at the extreme importance and utility of his subject—the vitality, the living power or force of the nation in which we are born to live and work together. Looking next at the question, 'What is this vitality?' he was bound to say that no great advance had been made towards the solution of this problem. Two theories were current among men engaged in the higher branches of science, one of which would look upon this life, which distinguishes the living from the dead man or animal, as something external to the body, but which permeates it while it lives. Others would consider it as a purely spiritual thing within the organ it animates. This last, which was in accordance with the oldest theory of spirit and matter, or spiritual life and material life, was certainly as much in harmony with science as with the simple teaching brought before them in their early lives (hear, hear). But leaving this question, it was more practical to think what is the amount of this vitality, what is the value of it as it is actually seen in motion during the lives of different individuals? The recent teachings of science had affirmed much of the old thought that life might be extended to a certain considerable degree; and physiologically, he saw no reason why life in every properly constituted being should not be extended to at least ninety years.

Age for Maturity.

If they began to analyse the phenomena of life, to look through the changes which take place in the structure of man, the changes in the solidification of his whole framework—his bones—the development by growth, the perfect development of the organs of the body, they saw that a full period of thirty years was required for the complete structure of this work. Thus, they saw that there was a period of thirty years, when the ascent of life having been made, the man was placed as it were on a level plain, on which he goes on pretty steadily; and, presuming that he is not subject to anything that would disturb him in his course, he comes to a decline, which again is marked by a period of thirty years. It might be asked whether there is anything more than mere theoretical evidence in this direction? To that he said decidedly, yes; and here, he observed, that we as a nation had advanced in our positive, in our arithmetical knowledge on this subject. The French School had once passed ours, but now, at this day, we might say that in our knowledge, derived from collected facts, we stand pre-eminently among the nations; and, he added in justice, that the English nation was indebted for this great advance in learning the value of life, the ranges of vitality, the modes in which this can be calculated, estimated, and determined upon, to the work of one illustrious scholar, who was with them that night—Dr. William Farr. He had brought the vital statistics of the nation down to such simplicity that he who runs might read, and that they might almost predict from his tables what will be the mortality of the nation to come. Returning to the question of the extension of life to ninety years, he related a few facts in support of his contention.

Percentage of Longevity.

The Registrar General told them the numbers of the people who lived at different ages when the last census was taken; that was in 1871. At the ages under twenty years, which he called the age of infancy, or the school age, or the apprenticeship age, the age of the coming generation of Englishmen, the number living was 10,436,229. At another age, which he called the athletic age, the beautiful age, the age from twenty to forty years, there were living 6,841,897. At the judicial age, the age of complete life, when the man or woman had all their powers, that age of which fifty years is the centre, it extending from forty to sixty years, there were living, 3,973,863—a diminishing quantity, it would be observed. The number of persons living who were between sixty and seventy years of age was 1,050,138. Between seventy and eighty years of age, there were living 499,779, or nearly half a million of people. The Registrar General told them more: this extraordinary fact, that in England, in the year 1871, there were living no less than 124,808 persons who were born before the French Revolution, and who were therefore over eighty years of age, and approaching ninety. Now, this was the point—if 124,808 persons might be found approaching ninety years of age, could not that number be multiplied? The Registrar General, aided by his figures, answered that question, by expressing his opinion that circumstances might occur in the improvement of our nation of such a kind, that actually one hundred years might sometimes be the duration of the perfect life. Here, then, he asked his hearers to let these simple facts rest upon their minds—that the natural duration of life, physiologically, was fairly ninety years; it might be more, but not less; that 128,000 persons were living who had nearly attained that age, and that the highest authority in the kingdom had represented that one hundred years would not be too long to represent the perfected life. Now, he turned to the solemn fact of the actual standard in the country; it was positively thirty-two years; in our present circumstances only one-third of the life given to us by the Divine Hand is enjoyed. That fact taught a lesson worth remembering. He next inquired if this was true as regarded all classes of the community and named a strange exception to the rule.

Vitality of the Jewish Nation.

There was a difference arising from race, and though the differences arising from race in our country had not yet been collected, it was found, from the mortalities of other countries, such as France and Prussia, which were nearly the same as those of Britain, that in a mixed community the Jewish race beat them in vitality. This was a surprising statement, considering the persecutions to which the Jews had been subjected; but he proved the truth of it from statistics, published in 1864, concerning the vitality of the inhabitants of Frankfort, where the two communities were nearly equalised. Dr. Richardson next proceeded to consider the circumstances that lead to the high mortality and the low vitality of the nation. This brought before them the startling fact that we are as a people living but one-third of our natural life. What interferes with the course of life is accident, commonly speaking,

alled disease ; but accident, nevertheless—as purely accident as one's life being terminated by being run over by a railway train.

There are 214 specific kinds of disease. Where do they come from, and what is their nature? Many of them arise from causes which existed when we were first placed on this planet, and will remain as long as man remains ; such as atmospheric pressure—the effects of electrical storms, of heat, and of cold, causes probably which interfere with the course of life to the extent of one-third. Upon the effects of cold and heat the speaker dilated at some little length, and pointed out how accurately they could gauge these by the statistics furnished from the Registrar General's office. Thus the effects of cold, for instance, were shown to have acquired a double fatality with every nine years of a person's life. If one person dies from a cold at thirty, two will die of it at thirty-nine, four at forty-eight, and so on. With a rise in the temperature, again, persons were subject to lightning and sunstrokes, and articles of food will disagree with them, and cause illness, which might be taken with safety in colder temperatures. Another large depression of national vitality is caused by the infinite organic germs, or, as he preferred to term them, particles which float about in the air, and produce infectious diseases, such as small-pox, scarlet fever, measles, etc. Having explained the action of these, he showed that they could be traced far away back to the early ages, typhus being known to the physicians of Greece and Rome ; and other well-known diseases, which unfortunately still exist, being clearly traceable in the plagues and pestilences of the dark and middle ages.

One great source of disease is uncleanliness, a fact which Dr. Richardson very forcibly illustrated by a reference to the recent outbreak of measles in the Fiji Islands, where the disease spread to a fearful extent, from the people living in such a huddled and dirty condition. The lecturer looked forward to the time when some clear-thinking man, with cultivated experimental powers, would devise some far better means than we have at present of counteracting the effects of these most mischievous organic particles. There were certain diseases, continued Dr. Richardson, that were incident to old age, but he would not dwell upon them, as they might be called the natural termination of life. But now he came to another important series of causes of death that were even more under control than those arising from the presence of the minute organic particles. There was some excuse for the spreading of organic particles, as the people could not be expected to have a knowledge of their existence. But there are a certain number of cases of a different order altogether, which produce a very large vitality—they are the habits and modes of life in which we indulge. Many may be called the induced diseases, the self-made diseases, and there are an immense number of them. First of all—passing through the whole community, and not merely through the upper commercial classes alone—is the strain after wealth, the desire at all costs quickly to be rid of work, and to rest. Nothing could be more delusive ; man was never intended to retire from work ; nature intended him to work from the first to the last of his days. But men were so eager to gain wealth, and at forty or fifty to retire with wasted brains to the House of Commons, or to administer justice amongst the great unpaid, that they killed themselves with the strain. And when they reached the summit of their ambition they found it all a shadow, and themselves broken-down men. Whereas they might have lived steadily through their lives, doing their work, and seeing their children's children's children.

There were certain mischiefs produced by the passions, especially anger. If there was one thing that more completely disorganised the mechanism of the body than another, it was anger. Another cause was irregularities with regard to food—a carelessness as to its quality and character. The most vital was the consumption of meat that was itself diseased. The animal had, perhaps, been poorly fed—poorly kept, and had consequently become inoculated with small living bodies—such as measly pork—and persons consuming it become affected in the same way. Thus disease springs up, and may end in a nervous epidemic. In Germany especially is this the case—the disease presenting itself in the form of a small round worm going the round of the body, and causing death. Greater care is requisite with respect to the selection of food, and here again the Jews set a good example in the strict manner with which they examine their food. Then there are certain diseases which arise from occupations—professional men, especially doctors, suffering most. But brain work was not nearly so detrimental as too much physical labour, unless accompanied by worry. Improper marriages also had an effect on the vitality ; especially the marriage of persons who inherit disease.

The most prevailing source of disease was that of drunkenness. It eats like a canker into the heart of the nation, though it is perfectly controllable—a disease that is begotten of a false pleasure, and that is as certainly vital when it takes a hold as the black death or gaol fever. If this nation could rise to-morrow a sober nation it would increase the vitality one-third. The large series of diseases produced by intemperance are clothed in learned terms ; but they are nevertheless produced by drink in the simplest physiological way. If his words would only take effect in this one direction, the lesson he had given would not be without avail. Again could a lesson be learned from the Jews. Why are they so favoured? They are not a strong nation ; and all superstitions with regard to their special protection could be set aside. It was because they had been more thrifty, because they had been more careful of their infantile life, and mainly because they had been more sober. In conclusion, he pointed out that, barring accidental causes, people had their lives in their hands, and it lay with them how they used them.

DISCUSSION.

Dr. Farr said he was sure they would feel grateful to the President of the Health Department for delivering the eloquent address they had just heard. It was quite in consonance with his character that he should devote his services to the working men, because he had worked as hard as anyone in the knowledge of the science which had for its object the improvement of the condition of the population of the kingdom. It must be gratifying to the working men to learn from him that labour was the natural life of man. Indeed, idleness was one of the most prominent causes of disease, although Dr. Richardson had not mentioned it. He asked the working men to consider their own interests in the matter of public health, for it rested as much with

them as with the authorities to see that they enjoyed the longest possible lives. Working men had now reached a standard of high intelligence; they were conducting friendly societies with great wisdom, and it behoved them to study the means which would improve their health. After speaking in favour of the views enunciated by Dr. Richardson with regard to cleanliness, he expressed a hope that the working classes would content themselves with a moderate use of beer and keep strictly within the bounds of temperance. Then he would expect them to enjoy healthy lives. He pointed out that, from an investigation he had made, he found that the rate of mortality amongst publicans was exceptionally high.

Mr. Alderman Mayall expressed the hope that the winding-up of every congress that came to Brighton would be a lecture such as that they had heard that evening. He was sure the causes of disease brought before them by Dr. Richardson, and the remedies, together with the means of avoiding them, was of the most important interest for the consideration of the working classes. All were exerting themselves to promote among the working classes habits of cleanliness and sobriety, by the establishment of baths which were a model to all towns, and the benefits of which were greatly appreciated by the working classes. He hoped the working men would take to heart one of the most serious crimes which existed in this country—a crime which was hurrying our population to an early grave—the crime of drunkenness. It had filled the gaols, pauperised the people, and filled the workhouses, and he was of opinion that one-third of the rates paid in the country was for remedying the terrible disaster which drunkenness has produced. He concurred with an expression of Mrs. Lewis, that much intemperance was caused by the bad manner in which food was prepared. It must be gratifying to Dr. Richardson to see so many of the working classes present.

THE VITAL STATISTICS OF THE COAST LINE OF ENGLAND.

BY ALFRED HAVILAND,

Medical Officer of Health.

THE author exhibited a series of maps showing, by different colouring, the various degrees of mortality from heart disease throughout England and Wales. It appeared that the most favoured spots in this respect were those lines of sea-coast where the sea winds had freest access to the country and along the course of tidal rivers. With regard to cancer, it appeared that the riparian districts of rivers that periodically flooded themselves, having alluvial deposits on their banks, had the highest rate of mortality; but with regard to consumption the rate of mortality in the same districts was very low. Dr. Haviland also explained the geographical distribution of typhoid fever and scarlet fever. The former, he said, is indigenous in rural districts, while the latter was imported into them. It was pointed out that a high coastal death-rate prevailed in regard to some diseases, which, it was believed, arose from the improper disposal of sewage; and it was urged that if watering-places were to be as healthy as they might be they must have better sanitary appliances than they possessed.

Dr. Child said his experience confirmed the statement of Dr. Haviland with regard to the distribution of scarlet fever and typhoid fever. He pointed out, however, several of the conclusions of Dr. Haviland, which appeared to be at variance with the observations of other persons.

Dr. Syson bore testimony to the extreme value of Dr. Haviland's maps, and alluded to the necessity of making better provision for the removal of sewage, and for the prevention of the spread of infectious diseases.

Dr. Farr also complimented Dr. Haviland on his labours, and alluded to the importance of the observations he had recorded.

The President confirmed, from his own experience, the observation of Dr. Haviland that where cancer was most prevalent consumption was least so; and made some remarks as to the connection between those diseases.

SANITATION OF HOUSES.

BY WILLIAM EASSIE, C.E., London.

THE following were some of the remarks made by Mr. Eassie, C.E., of London, in the paper which he was invited to read in the Public Health Section, upon the question of house sanitation. Pointing out some of the many mischievous mistakes which are made in the choice of sites, he said that where the cry is still for a gravelly soil, many country houses are, for instance, erected upon absorbent gravels of common river origin, and resting upon non-absorbent rocks, instead of drift gravel; the consequence being that impurities filter downward and remain there.

And if the erection of houses in town upon gravelly sites are carefully watched, it will be found that too often the surroundings are excavated for sand and gravel, which are carted to other sites, the voids being filled up with the abominable screenings from the nearest dust yards. In London whole streets have been erected upon fever-beds of this description. Now that the ground air has been examined, and carbonic acid even in fair gravelly soils found to range from forty to eighty volumes per thousand, it is not difficult to estimate the unwholesomeness of such sites. A good gravelly soil is preferable to a clayey one, but the outcry against the latter is often a senseless one, inasmuch as if proper precautions are taken when putting in the foundations and house covered superfices, healthiness is in no way impaired. With a clayey soil it is possible to remove all drainage to a distance, whilst with a gravelly soil the surface-drainage will sometimes foul the subsoil water.

Even when a stony site is chosen, a certain care must be exercised, for Mr. Eassie had lately inspected an old English mansion built upon the oolite formation, and found that the sewage from the cesspools had travelled, by way of the fissures in the rocks, some two hundred yards, and destroyed two of the best wells. Thus the dip of the beds have sometimes to be taken into consideration. As for the foolishness of erecting houses upon too low-lying lands, sufficient has not apparently been said, for very often we see residences which have been built upon the banks of rivers subject to floods, and as the river rises, so rises the subsoil water unseen beneath and around it.

The author saw a curious instance of this in Hampshire not long ago, where the rise in a river

some quarter of a mile distant could be accurately gauged, Nile fashion, in a disused beer cellar. Had the cesspools not been imperviously built the greatest mischief must have ensued, a mischief which even the permanent retreat of the river could never cure, for when once the soil is polluted in this way the wells are rendered unfit for potable uses. The valleys of tidal rivers should not be purposely selected either, for there the malarial factors exist in a marked degree. Equally should the neighbourhood of stagnant waters be avoided, for during the summer, when rapid evaporation is going on, the neighbourhood is unhealthy. Where the water is regularly in motion, and not subject to floods, as is the case with most ornamental waters, and when the residence has been built some twenty feet above the water-level, this last objection does not apply, for the author had been asked to inspect old moated houses, and could never hear of any accruing ague. It is when the site is first under water and subsequently dried up by the sun that disease may be predicated. And not more surely will excavation in organic *débris* give rise to malaria, than will ague be engendered by the digging up of such soil, and of the moss-grown and damp gravel paths which are always seen around a house which has been unprovided with surface drainage.

Where, unfortunately, a house too good to abandon has been built upon marshy land, the land should be systematically drained, and the surroundings of the house planted with vegetation which has been found to rapidly absorb moisture. The Eucalyptus and Helianthus have been found especially useful in this way. All plants and flowers possessing green leaves and aromatic odours are also proved to yield ozone when exposed to the sun's rays, and this agent is malaria's deadliest foe. There is also the rising wet and the drifting wet to keep out of the walls of the house, and this is only to be achieved by using damp-proof courses a little above the ground line, and by adopting hollow walls. Impervious walls are a mistake; for the constant vapour given off in the house will condense inside and soak into the walls, and not allow it to be passed through the pores to the outside. In like manner the new washable wall linings and water-proof paper hangings are objectionable for the inside of exterior walls. The last kind of dampness which he would notice was that which resulted from the absence of proper area walls, and by the banking up of damp earth against the basement walls. No cure exists for this state of things in the way of damp-proof washings, nothing but the interposition of an area space. When a stone cellar-floor has been laid upon the bare ground, or what is just as common to discover, a wooden ground-floor, the resulting chilliness is unbearable, and when 'motley' like this has been the wear, the only cure is concrete. Houses, too, are far too frequently partially built of old materials, and for the most part these old and sodden bricks and brick bats are used up in the interior partition walls; nor is that all, for the old plaster is commonly worked up with the new to facilitate setting. This is a fruitful source of evil, and has been alluded to as accounting for a good portion of our metropolitan mortality. In the author's opinion, these old bricks should never be used until they have been set up again kiln fashion, and cremation performed upon whatsoever of organic matter they contain.

Speaking of the dust-bin nuisance, or what he called the dry cesspool nuisance, they were mostly boxed up in close areas, and near cisterns, to await the dustman's leisure. It would be wiser to provide two movable dust-bins, one for the reception of ashes and house-sweepings proper, and another for the vegetable and kitchen refuse. This would not only save a great deal of labour to the parish in sifting at the dust wharfs, but would prevent an incipient putrefaction in the dust-bin itself. We cannot be too careful about the air we breathe, for infection takes place through respired air as well as by inoculation, and enteric fever is associated as well with the pollution of air as of water. Disinfectants are all very well, but it is doubtful whether anything can disinfect the air or render inert the evil agent; whether, in fact, the atmosphere which is found necessary to destroy contagion is capable of supporting human life. Even the more legitimate dust of the house is mostly charged with matters which might develop into disease if rendered putrescible. We should, therefore, get rid of all dust, the innocence of which it is impossible to test. Cleanse it from our floors, shelves and cupboard tops, and not dry dust—which is simply moving it policeman fashion, onward—but wipe it with wet cloths. House dust is also sometimes rendered poisonous by the fluffs given off from wall papers, arsenite of copper from green flock papers, and coralline from wall papers when an arsenical mordant has been used to fix the red colours.

It ought to be an invariable rule, where well waters are in use, to have them analysed, for no care during inspection can possibly reveal the many chance agents of underground pollution. Fully two-thirds of these supplies are found to be dangerous to health. It is not always safe to say that because no apparent source of evil is to-day visible, that a well yields an immaculate supply. The author had occasion lately to suspect, from its very sparkling character, the water taken from a well in a very healthy looking position, which supplied several families and a large dairy, and had the water analysed. Professor Wanklyn's report upon it was that it was absolutely poisonous, and then it was found that the constant drinkers of this water had long been suffering from a skin disease. Inquiry also revealed that a farm steading had formerly stood there, and we can guess what these used to be in the olden time, and that the subsoil was, therefore, full of impurities. No amount of filtering could render water of this kind pure. Filters can be made useful, without doubt, but even they must be examined periodically, and a proper material chosen. He had an analysis made of some water drawn at the butler's pantry in a nobleman's house, and it was proved that the filter in use, with its impure animal charcoal contents, actually rendered a pure supply from the mains unfit to drink.

Speaking of the gas-supply of our houses, which has at no time as yet received sufficient attention, Mr. Eassie made bold to say that if the houses of London were carefully tested, not a twentieth part would prove free from escapes of carburetted hydrogen. A few weeks ago he had a partially new house tested for a client, before occupation, and found five very serious leaks in the partitions where mere smell could never have detected them. It is not an uncommon thing to find families who have been suffering for a long time from this slow poisoning. It takes one part of gas to eleven of air to constitute an explosive compound; but an atmosphere containing one-fifteenth of coal-gas will cause the death of a rabbit in a very few minutes. There can be no doubt

that numbers die annually amongst us from this fatal carelessness; and amongst the other diseases brought on by gas-poisoning, Dr. Lockie enumerates congestion of the brain and kidneys. The author would therefore say to all those who burn gas, test your gas-pipes without delay, and see them tested in the only safe way—which is by stopping up all burners but one, and fixing upon that a mercury-gauge, connected with a pump, nor resting satisfied until, when a little ether is introduced into the pipes, its escape cannot be detected, and until no subsidence of reading can be noted on the gauge. In some towns of America, the gas companies will not lay the gas on until their inspector is satisfied in this way that no escape is possible; whereas with us, the gas companies do not seem to care a brass farthing whether the house-pipes leak or no, provided that they sell their gas. The system which he explained ought to be practised by every gas-fitter, nor should a gas-fitter be allowed to practise unless certificated and in possession of this contrivance. With us a gas-fitter is sometimes a blacksmith, whitesmith, glazier, brazier, plumber, and bell-hanger, all rolled into one. A common force-pump, however, is not the kind to use for testing a gas-service. And he mentioned this lest the hint he gave might induce some householder to have recourse to it. It was a crying scandal to be obliged to say it, but he was certain that not one gas-fitter in a thousand ever heard of any scientific method of testing pipes after they had been laid down between floors or spiked up in the walls. In country houses coal-gas should never be used, but rather the oil-gas apparatus, which was not only one-third the cost, but was pure enough to use in the finest exotic-stocked conservatories. In Lancashire this gas had been in use for years in many houses, and even in factories, and he had inspected several large establishments thus supplied.

SUGGESTIONS AS TO THE LEGISLATIVE CHANGES REQUIRED FOR THE PURPOSE OF IMPROVING LABOURERS' DWELLINGS.

BY DR. G. W. CHILD.

THE object of the paper was to show that there are certain sanitary evils affecting labourers' cottages which cannot be dealt with under the existing law, viz. :—1. Sites which are improper and unhealthy, or 2, which are too confined in space. The latter was exemplified chiefly in the case of 'squatters' cottages,' or those which were originally such. Under the existing law these can be closed as unfit for habitation, but the remedy is worse than the disease, inasmuch as to close cottages tends to overcrowd others. The writer proposes an Act which shall compel an adjacent owner to sell a given portion of the land adjoining such cottages—say one rood—provided that the owner of the cottages can buy it within a limited time—say six months. Failing this the cottage owner is to be compelled to sell his cottage, and the adjoining landowner to have a right to buy it; provided, also, that he do so within six months. In each case the cottage is to be either rendered fit for habitation or else pulled down within a further space of six months. The remainder of the paper was occupied with answers by anticipation to some of the more obvious objections to these propositions, showing especially that they are not more arbitrary than other provisions of the sanitary law already in force.

THE SEPARATE SYSTEM OF TOWN SEWERAGE.

BY LIEUT.-COL. JONES, V.C., of Wrexham.

THIS paper opens with the definition of a sewer and a drain, and shows that when waterworks were introduced it was desirable to provide distinctly for the removal from the town of so much foul water as the new works brought in clean. The old drains of towns were already fully occupied by surface and subsoil water, and it was a mistake to encumber them with sewage. They were liable to be choked up with road detritus, and the current of sewage in dry weather was very sluggish along the broad inverts of such channels, which were necessarily made large enough for storms of only occasional occurrence. No arrangements can provide for the purification of the whole quantity of rainfall and sewage in time of storm, and consequently provision is always made by overflows for an occasional escape of this mixture into the nearest water-course, but Lieut.-Col. Jones contends that it would be better to allow the rain water to flow into the nearest water-course directly, instead of through the medium of a foul sewer. If sewage is to be pumped, purified, or utilised in any way, it is evident that the expense of such processes must be nearly proportionate to the volume of sewage dealt with, and consequently it is desirable to keep out of sewers any water which is sufficiently clean to pass into a river. Lieut.-Col. Jones, speaking from his own experience, asserts that the uncertainty due to rainfall is often sufficient to turn the profitable use of sewage upon land into an absolute loss, because a farmer least desires to have his land deluged by a weak solution of manure at the very time when he is receiving more water than he needs from the clouds. The separate system has been tried for more than twenty years with good results at Tottenham, and for shorter periods at Aldershot, Eton, Windsor Castle, etc.; it is also now being adopted in the great sewerage works in progress at Oxford, but the combined system still lingers in most of our towns, and it seems desirable that borough surveyors and local boards should attend to this matter, so that extensions of sewerage works so frequently required throughout the country may not be carried out oh a faulty system.

DISCUSSION.

Mr. Angell agreed that it was necessary that there should be unity of management in carrying out drainage works; but until county boards were established he did not see how there could be county sewers. There was also the difficulty as to intercepting sewers, and the question of the outfall. Surface drainage should, wherever it was possible, be separated from sewerage; but this could not always be done. Surface drainage was sometimes almost as bad as the sewerage itself, and ought not therefore to be poured into rivers from which potable water was taken.

Mr. Hope referred to the necessity of subsoil drainage prior to the erection of houses; and also

to the superior method of dealing with the streets in Paris as compared with those in English towns. He thought that all sewers in great towns would have to be remodelled on the separate system. He recommended an alteration in the form of the sewers, by which the *detritus* contained in it might be more spread out at the bottom.

Mr. Baldwin Latham said that the proposed alteration in form would be highly objectionable. He opposed the plan of generalisation proposed by Mr. Baylis, on the ground of cost and other objectionable features. He opposed the exclusive use of the separate system, and said that the surface drainage was often so impure that it ought not to be poured into rivers. Each case should be dealt with on its particular merits.

Lieutenant-Colonel Jones said that exception had been taken to the analyses of surface street drainage, which was not so impure as had been alleged; and Professor Vœlcker was of opinion that that drainage might be safely received into rivers if not contaminated by sewage.

SCHOOL SITES, BUILDINGS, AND FITTINGS.

BY SIR CHARLES REED,

Chairman of the London School Board.

Sites.

THE London Board had to determine not only the number of places wanted, but the exact locality in which the need existed, the metropolis having been set out into 459 blocks. In the selection of sites the Board was guided by considerations (1) of the convenience of parents; (2) of the relative distance from existing efficient schools; and (3) of the cost—always governed by the requirements of the Act that the accommodation required for each district should be sufficient, efficient, and suitable. It was not till eighteen months had passed that the first school was ready, and at the present time, though 102 new schools are opened, thirty-three are still in course of building, and others are yet to be provided. Adding schools transferred to the Board, we have control, up to the present time, of 199 school-houses in 436 departments, containing 112,901 children.

Buildings and Fittings.

It must be confessed that much of the work at present is carried on at grave disadvantage in ill-built, badly drained, and imperfectly ventilated rooms, where, as the conditions of physical health are unfulfilled, it is vain to expect large mental results. A school should be a nursery of health as well as of intelligence. The old Lancasterian school was, as many of us remember, square, forbidding, and grim. The scholars sat at long desks in close ranks; the teaching was simultaneous, the confusion great; of individual attention there was none save what was supplied by the touch of hazel fishing-rods long enough to reach the hindermost row. It was in 1840 that the Committee of Council issued plans of schools upon which most of our modern buildings have been constructed; but the rooms were still long and narrow, with unsatisfactory cross-lights, and one side divided off by thin curtains for class purposes. The plans adopted by the School Board of London may be thus described. Where land has been exceptionally dear—and where in London is it not so?—buildings of three or four stories have been essential, with, in some cases, playgrounds on the roof or under arches, but in every instance some provision for the recreation and drill of the children. The schools are graded, except the infant department, each department having a floor to itself. The rooms as a rule are twenty-two feet deep and fitted with dual desks, so arranged that the teacher can approach and sit down beside each child. Sufficient class room is attached to every school, so that half the children are in the main apartment and half in the detached classes. The class-rooms, twenty feet square, give accommodation at these double desks for forty children. Every scholar has light admitted from the left so that no shadow falls from the hand in writing and no glare dazzles the eye. By fixed partitions with doors, now considered superior to sliding ones, the class-rooms can be subdivided at pleasure. Two schools are built upon the German model, one containing eight class-rooms on first and second floors to seat sixty pupils each, grouped round a large assembly hall; the infant school, divided into two rooms, occupies the ground floor, and gives space for 575 children. It is believed that by degrees this arrangement will largely obtain—a separate room for every class, and an assembly hall capable of receiving at least two departments of the whole school. The best middle-class schools are now built upon this model at a cost little if at all augmented. Those who have inspected the best schools in Europe and America will certainly join in the growing demand for more class room and superior apparatus. The principal novelty in the latter is the desk. In Sweden and America, where wood is cheap, single desks of beech or pine are provided. The London children sit two and two at desks forty inches long, placed five deep, with gangways sixteen inches wide. The incline is slight, and both feet and back are well supported. These desks take the books for reading, the slate and copy-books for writing, and form a stand for music, while space is provided underneath for books not in use. These details are of more importance than some imagine, for upon the comfort of the child depends in a large measure the success of his work. It is well that the old long-length forms without backs or footboards have given place to seats from which the pupil can rise on a signal or at which the teacher can join him at any moment. Great pains have been taken to secure ample scope for the infants, so that they can march about and sit without restraint. To each child are given eight feet of floor space, and a sloping gallery is provided with full top light and furnished with backed seats, five deep. The cruelty of keeping a crowd of little ones feverish and undisciplined has been at length discovered. A great point is made of adequate office and lavatory accommodation, with filtered drinking-water and ample provision for hanging caps and bonnets outside the school-room. Each school has its room for drawing, its work and cutting-out room for girls, and a retiring room for the teacher, fitted up with a library for reference.

THE Sheffield Town Council have resolved to borrow part of a first sum of 250,000*l.*, to commence a great scheme of street improvements, which will cost about 2,000,000*l.*

ON SCHOOL HYGIENE AND SCIENTIFIC PHYSICAL EDUCATION.

BY DR. ROTH.

THE author described the proper arrangements necessary for the preservation and improvement of the health of children and youths of both sexes in all kinds of schools. The school building was to be built for children and youths at school who had to pass there a great part of their life, and at a time when they were most impressionable; for children, who were in school in all seasons, whether cold or warm, and who require a constant supply of sufficient fresh air, pure water, warmth, natural and artificial light, and during their various occupations comfortable positions; for children who were not only to be removed from all influences injurious to their health, but who are to be surrounded by all the conditions most favourable to their bodily and mental development. Many sincere friends of education are still under the erroneous impression that drilling, calisthenics, dancing, athletics, and gymnastics are identical with or substitutes for physical education; but his professional experience as a physician during thirty-five years, and especially since his attention has been directed to the causes of many preventable diseases and deformities caused by the parents', nurses', and teachers' ignorance of the elements of hygiene and physical education, imposed upon Dr. Roth the duty of expressing his conviction that the teacher must be for every individual what the officer of health is for the parish; and that the prevention of many diseases and deformities depended, not upon medical men, but upon the teacher's knowledge of this important branch of education, a knowledge which is the most important and the only means of improving the low *physique* of the population. Children should be in the best condition of health when first sent to school, just as the raw material must be first-class if the best product is to be obtained. Unhappily, the supply of healthy children is considerably lessened in consequence of the large amount of disease prevalent among children, as proved by a mortality of 45·50 in 100 before they are five years old. As one of the principal causes of this prevalence of disease, Dr. Roth named the frequent mismanagement of babies in consequence of the ignorance of mothers and nurses.

TRAINED NURSES FOR THE SICK POOR.

BY SIR EDMUND LECHMERE.

HAVING traced the history of previous efforts to draw public attention to the value of district nurses for the poor, and especially the action taken by the English branch of the order of St. John of Jerusalem, which led to the formation of the Metropolitan and National Association for providing trained nurses for the sick poor, the writer drew attention to the valuable example afforded by the Liverpool and the East London Nursing Institutions, both of which had devoted themselves exclusively to the nursing of the poor. He urged a year's training in a first-rate hospital, and subsequent experience in district nursing, as the minimum amount of training which should be required. He suggested the connection of district nurses with provident dispensaries, and where not so connected, a small payment by the poor where possible. He urged the profession of a trained nurse, provided the standard of nursing is raised, and adequate pay is offered, as one worthy of consideration by women of superior intelligence and education, and showed the valuable preventive agency in repressing the causes of diseases, which an organised body of nurses of such a character, acting under proper authority, supported by a powerful association, and recognised by the Local Government Board, might secure.

THE PRINCIPLES ON WHICH LEGISLATION RESPECTING THE POLLUTION OF RIVERS SHOULD BE BASED.

BY DR. CORNELIUS FOX,

Health Officer of East, Central, and South Essex.

SO much has been written and spoken relative to the great question of the pollution of rivers that the minds of legislators and scientific men must be wearied with the whole subject. That the people of this country think it a very important one, and desire earnestly that some satisfactory settlement may soon be arrived at cannot be doubted. To many it is a question fraught with danger to trade, and therefore to be opposed in every shape and form. And yet every one who has ever thought on the matter would, I believe, freely acknowledge that to convert our streams into open sewers is very unwise in every sense of the word. The public have apparently ranged themselves into two classes on this question, as they do on almost every public one; those, consisting principally of manufacturers, who oppose legislation having for its object the prevention of the pollution of rivers on the ground of its interference with trade; and another class, who advocate their restoration to the condition of trout streams. To permit the filthy inky watercourses of the manufacturing districts to remain in their present state is to allow a few score of men to afflict thousands with gigantic public nuisances. To quietly sanction the pollution of 3,000,000 gallons of river water daily by five firms, as at Bradford, and to complacently allow 75,000 tons of cinders to be annually deposited in the river Irwell is of course suicidal policy. To argue that, because manufactories which pollute streams and air give sustenance to hundreds and thousands of workpeople on their banks, whose vital energies are lowered (thus rendering them a more ready prey to disease), and whose offspring are stunted and depraved by the unwholesome influences to which they are subjected; to argue, I say, that, because these great industries fill the stomachs of these people, they ought not to be required to be conducted in a manner which is not detrimental to their health, shows a want of all proper feelings of humanity. Whilst, however, condemning an extreme degree of pollution, I do not, like many, think that it would be wise to be too exacting as to purity.

Those who are acquainted with the practical working of the Sanitary Acts, and are engaged in an incessant warfare with the development and spread of preventable diseases, know full well that the principles on which all their work rests consist mainly in the prevention of air pollution and of water pollution. Filth in the air we breathe, and filth in the water we drink, is the one great enemy in two different media against which we health officers are always fighting.

As the question of the pollution of rivers is primarily and essentially a sanitary one, and secondarily a commercial or pecuniary one, why, I ask, should not the same principles be applied in dealing with it as with all other sanitary evils which involve exactly similar considerations? It will, I presume, be acknowledged that for legislation on this question to be possible, all extremes must be avoided. To advocate the restoration of our streams to a state of purity resembling that of a mountain rivulet is to obstruct and in fact to oppose all legislation on the matter. The crippling or destruction of many industries of national value would necessarily follow such an enactment, for the expenditure incurred in purifying their waste waters would consume or most seriously affect their legitimate profits. I maintain, moreover, that, if it were possible, it would be force wasted, for no adequate compensatory advantage would be gained. All who have paid attention to the very interesting topics as to the effects on health of various kinds of water agree that spring water is to be preferred to all other kinds, and that river water *un*polluted to any extent by sewage needs more or less of purification by filtration, etc., which is costly, before it is fit to drink. The Duke of Somerset placed the matter in its true light when he recently said in Parliament: 'The foul matters encumbering streams may be got rid of, but the notion of their supplying water fit to drink must be altogether put aside. Towns must be supplied with pure water for drinking purposes in some other way.' As the prevention of the pollution of the foulest of our streams would seem to necessitate the stoppage of important industries, and the purification of such streams so as to render them adapted for drinking purposes is of course not to be thought of, let us ask ourselves the questions—(1) What harm do these streams corrupted by sewage and trade products do, and (2) How are they to be prevented from inflicting injuries?

(1) WHAT HARM DO THESE STREAMS CORRUPTED BY SEWAGE AND TRADE PRODUCTS DO?

(A) *Many of them pollute the air lying over them and on their banks.*—Noxious odours sometimes or always arise and annoy those who live near them, or those living at a distance who approach them. If human beings are exposed frequently to unpleasant smells, a deleterious influence is exerted on their health. I know all that may be said in opposition to this statement. I shall be referred to the absence of any noticeable evil effects in London during the year when the Thames was so odoriferous, and to the supposed immunity from cholera and other preventable diseases of the sewer men of Paris, etc. It is a well established rule, to which there are some apparent exceptions, that there is a greater mortality amongst those who are exposed continually to offensive odours than with others who are not so circumstanced, and that the diseases from which the former suffer are of an asthenic type and tend to death rather than to recovery. A certain amount of 'vis medicatrix naturæ' is lost by them, and its want is felt at critical periods of sickness when most needed. Evaporation is constantly in a greater or less degree proceeding from the surface of water; and organic impurities contained in the water, if excessive, are mechanically conveyed into the air during this process of vaporisation. The odours of many of these rivers, like those of foul ponds, are generally noticed more at sunrise and sunset than at other periods of the twenty-four hours, in consequence of the descending dew preventing their diffusion and rendering the impurities soluble, and thus more perceptible to the sense of smell. My experience as a physician has taught me that it is prejudicial to health to frequently breathe air polluted by emanations from very foul water. Unpleasant smells are danger signals, and although it is absurd to fear an attack of illness whenever we have our olfactory nerves offended, yet there can be no hesitation in saying that the continual exposure of the human frame to polluted air tends to engender ill health, even if it does not create disease. The contamination of the air by many of these streams is as great a nuisance (taking this word in both its literal and legal or popular sense) as the pollution of the air by volumes of smoke, which is, subject to some saving provisions, an actionable offence.

(B) *Many of them destroy fish.* Certain kinds of fish, such as the trout, require, in order to live, water of great purity. Others, such as chub, dace, roach, jack, barbel, perch, pike, eels, etc., flourish in water which would be considered comparatively dirty, whilst no fish whatever will, I believe, live in some of the most impure streams and in those poisoned by the metallic waste of mines. In rendering streams so foul or poisonous that no fish can exist in them, certain manufacturers and miners damage one of our food resources, by rendering an important article of diet scarce and dear, and therefore not to be procured by the poor man, and by lessening the self-reliant powers of the country.

(C) *Silting up of watercourses and obstruction to navigation.* The quantities of solid impurities thrown into some streams are so great as to fill up their beds, thus creating inundations of their banks higher up. These solid matters produce a silting up of rivers, and an obstruction to navigation by the accumulation of offensive banks of mud. On public grounds these evils should be rendered impossible.

(2) HOW ARE THE STREAMS TO BE PREVENTED FROM INFLICTING INJURIES?

The injuries being the pollution of the air (for no one ever thinks of drinking such water), the destruction of all kinds of fish, or an obstruction to navigation, and to the escape of surplus waters during flood, my answer is simply and solely the following. Let our scientific chemists ascertain the point at which a stream begins to be so impure as to contaminate the air lying over it, and here let a line be drawn. Let them ascertain the point at which a water becomes so impure as to prevent life and multiplication of the less particular of the finny tribe, and here let another line be drawn. Let them ascertain the amount of suspended impurities a stream may contain, without depositing in its course sufficient to offer at some future time an obstruction to the ready escape of flood waters and to navigation, and here draw a third line. Whether these lines would coincide or not I do not know. Probably not. The nature, as well as the quantity of the impurity, would have to be considered in a question of this sort, the rapidity of the stream and many other matters. Standards of some kind we must have as well for the protection of the innocent as for the ready conviction of the guilty. To attempt legislation without any definite rules for guidance would be to court a failure. I maintain, then, that, instead of establishing such im-

practicable standards as were recommended by the Rivers Pollution Commission, we should adopt three simple standards of the kind just indicated. No stream should corrupt the air lying over it or on its banks, under any conditions of air-pressure, temperature or humidity, or level of its waters, for, if it does, it is detrimental to the health of those living near it. No amount of impurity in a river should be tolerated which would injure one of the food supplies of the people, to wit the less dainty feeders amongst our river fish. No stream should contain so much suspended impurities as would tend to its obstruction in time of flood and to the silting up of the mouths of navigable rivers. As for the practice in some parts of shunting large quantities of cinders, ashes, and solid refuse into streams in order to avoid the expense of carting them away, and of placing solid matters on the banks of rivers, so that they may be washed into them in times of flood, such proceedings should be rigorously prohibited by law as being injurious to public interests.

As regards the pollution of *tidal* rivers the law, as it at present stands, is not in accordance with the spirit of the rest of sanitary legislation. It is illegal to pass any filth into a tidal river according to the Public Health Act of 1875. If filth is passed into a river, and anyone can show that he is injured thereby, the health authority of the district is liable to an action at law. Some rivers are guarded by conservators or water-bailiffs, whilst others are not so cared for. How are the silting up of the banks of tidal rivers, and the accumulation of filth interfering with navigation, to be prevented in the case of rivers not fortunate enough to be possessed of guardians? It is of no use to forbid a thing whilst unpossessed of any power to prevent that which is forbidden from being effected.

To establish three simple standards of the kind which I have suggested is to extend the sound principles of sanitary law, the burden of which is, that you shall do nothing which is injurious to the health of your neighbour or to the public welfare.

THE DUTIES AND RESPONSIBILITIES OF PORT SANITARY AUTHORITIES.

BY HARRY LEACH.

THE author, in introducing the subject, gave a brief *résumé* of the state of the International Sanitary Laws as regards ships, especially with reference to quarantine, and showed that at the present time quarantine had, off the coast of the United Kingdom, practically ceased to exist, except in cases of plague and yellow fever, two diseases almost unknown in these latitudes. The important duties devolving upon Port Sanitary Authorities were then described in detail, the port of London being taken as the text, as having the largest number, and most varied classes of vessels and cargoes, as well as an exceedingly complex system of docks, creeks, and tributaries. It was shown that the shipping may not only directly aid the importation of disease from port to port along our coasts, and also from town to village, by means of the inland canals with which latter most of our chief ports are directly connected. The magnitude of Port Sanitary work was shown by the fact that, at the present time, our merchant fleet consists of 37,000 vessels, requiring 331,000 men to man them; that our emigrant ships carry from 200,000 to 300,000 persons annually, that there are from 10,000 to 20,000, and 40,000 fishery smacks on the registers, and that the total floating population may be calculated at more than half a million.

EXHIBITS AT THE SOCIAL SCIENCE CONGRESS, BRIGHTON.

MESSRS. R. FRY AND CO., of Brighton, deserve the confidence of all drinkers of artificial aerated waters from the care which they have taken to prevent contamination by lead. We have from time to time drawn public attention to this very common source of poisoning from the enormous quantity of lead which these mineral waters are capable of taking up in solution from the pipes and vessels in which their manufacture has been carried on. Commencing at the fountain head, Messrs. Fry in the first instance use only distilled water as the basis of their manufactures, thereby eliminating all traces of earthy and organic matter. The metal pipes and receptacles for the liquids in their various stages of manufacture are formed entirely of block tin, and all the manipulation of the different liquids and ingredients is done entirely by machinery. By these means Messrs. Fry are enabled to guarantee the absolute purity and wholesomeness of their many varieties of aerated waters.

MESSRS. WRIGHT AND BUTLER, of Birmingham, exhibit their petroleum heating and cooking stoves, which are worthy of great praise from their simplicity, safety, portability and economy. The difficulties and objections which at one time rendered petroleum not only unpleasant but very unsafe, have been entirely overcome, and the atmosphere of the room in which these stoves are in use is entirely free from any of the vitiated products of combustion. The stoves are made of all sizes, both for heating and culinary purposes. Not the least advantage which these petroleum stoves and ranges possess is their extreme portability, as they can readily be moved from room to room as required. The cost of the fuel in an ordinary sized heater is something under ½*d.* per hour, so that no one need suffer from cold when an efficient heat-producer can be obtained for the very moderate cost of one of these stoves and the requisite petroleum. Messrs. Wright and Co. also exhibit a *specialité* in the way of a new petroleum burner, which they designate as 'the Queen's.' These burners have been highly spoken of by Dr. Hill, of Birmingham, and Professor Gardner, of London, as furnishing a full, smokeless, and beautiful light, ensuring perfect combustion, and giving out at its full power a light equal to twenty-two candles, at a consumption of only forty-three and three-quarter grains of oil per candle light per hour. The burners have a patent float register attached to them, which, indicating the height of the oil in the lamp, gives these lamps a special advantage. Messrs. Wright and Butler's manufactures can be obtained from all ironmongers.

MESSRS. KING AND BROWNE, of 93 Wigmore Street, have a superb display of lamps, on some of which artistic talent of a high order has been brought to bear in the way of shape and decoration of all kinds. Specially grateful to the æsthetic taste are those opal shades which, having artistic designs stamped on them in relief, present the effects of light

and shadow in a soft and pleasing picture to the eye. In others, again, the mould of form predominates, and the beauties of the Grecian, Etruscan, and Roman shapes have been reproduced in order to combine the *dolce* with the *utile*. Whilst praising the artistic beauty of Messrs. King's manufactures, the specially useful features must be noticed; these are a clear and intense light, of great purity, freedom from smell, and entire freedom from the danger of explosion.

The latter advantage is secured by a peculiar contrivance, which secures an ample supply of air, and a perfectly equal distribution of the flame. Messrs. King aptly enough christen this special article of manufacture the 'Brighton Lamp.' They are made in all sizes and in every variety of shape, and at prices to correspond with the purses of the rich and poor.

MR. JOHN PARKER, of Woodstock, Oxford, deserves mention for the excellent automatic earth-closets which he exhibits. Mr. Parker states that these earth-closets were first brought into use in the rectory at Woodstock, twenty-seven years ago. In that case, the inventor of these appliances deserves special honour as being an early pioneer of the dry-earth system. The closets themselves are simple in action, very portable, and effective. The automatic action renders them secure from tampering or that negligence which is one special objection to many otherwise excellent inventions of this character. Their cheapness, also, is another very great recommendation. In competition with other appliances of a like nature, they have been awarded a certificate of merit at the Exhibition of Sanitary Appliances, held at Norwich in 1873; have gained prizes at agricultural shows, and silver medals at Chester, Manchester, Preston, and Stalybridge; and have been supplied to Sandringham, and are used in hospitals, unions, factories, works, schools, mansions, and cottages.

MESSRS. BRADFORD AND CO. have been for so many years identified with inventions for domestic comfort and labour-saving appliances, that they stand pre-eminent in their special articles of manufacture. Their washing-machines are too well known and appreciated to need any special description save that they are all made on the rotatory principle, similar to that of the old-fashioned 'barrel churn,' except that by means of cog-wheels a very high degree of speed is obtained. This principle of action, whilst it thoroughly cleanses the linen, obviates the enormous wear and tear which was incidental to the old-fashioned plan of pounding. The machines are made in all sizes, from that which is required by a small family to the requirements of a large public institution, which will wash fifty shirts in ten minutes, and requires a steam-engine to work it. Incidental to the washing, wringing, drying and mangling machines are made in every variety. Another special feature is the patent radial drying closet, in which all the heat of a stove is utilised for drying purposes. The clothes-horses consist of upright pillars revolving readily on their own axes, fitted with nicely balanced, horizontal, radial arms in a spiral form. These 'clothes-horses' will revolve as readily when loaded with clothes as when they are empty, and by means of this revolution all the linen thereon is speedily and equally dried. This drying closet might, with a little modification, be utilised as a disinfecting chamber.

They also show a new patent 'declivity churn,' which, by a novel motion, dashes the cream upwards, and so ensures that thorough and rapid atmospheric influence which is essential to produce rapid churning and hence good butter.

MESSRS. BROWN AND GREEN, of 72, Bishopsgate Within, exhibit a large assortment of stoves and ranges, which they claim to be a certain cure for smoky chimneys; economical in the consumption of fuel; and specially constructed for roasting meat in front of the fire at the same time that the ovens, boilers, and hot-plates are kept in full action. The ovens are perfectly ventilated and thoroughly efficient, either as roasters or for baking bread or pastry.

The name of Brown and Green is synonymous with cooking ranges and stoves; and the number of prizes they have received from various exhibitions testify to the excellence and variety of their manufactures in their special branch. Their ranges are made of all sizes, and at corresponding prices, either for small families or large institutions; and not the least advantage which they accomplish is the great saving of fuel. One of their great specialties, however, is the double-action warm-air ventilating stove, for the warming of public buildings.

It is constructed with a series of internal pipes of wrought-iron, which pass through the bottom of the stove into a chamber above the fire, and are protected from overheating by a fire-brick lining; there is a constant current of air through them, which, becoming heated in its passage, is discharged into the room, or conveyed away by a pipe to warm some other part of the building. If these internal pipes are connected with the external air, a constant supply of fresh air may be warmed and discharged into the room, thus securing a perfect system of warming and ventilating.

MESSRS. BILLING AND CO., of Hatton Garden, have devoted their attention specially to the utilisation of gas for cooking purposes. When gas was first utilised for culinary purposes, the unequal cooking and unpleasant flavour which it imparted to the meat was such as to more than neutralise the benefits which it conferred. These objections Messrs. Billing have thoroughly overcome by means of the reflecting system, by which the joint is cooked from below the flame instead of above it. All the noxious products of gas combustion are thereby avoided, and the comestibles are cooked to perfection, cheaply, quickly, and well, and without the necessity of constant supervision which a roasting-jack or an ordinary oven entails. The latter is a very great advantage, as in these stoves a joint can fairly be left to 'cook itself' without fear or misgiving as to the result being anything but satisfactory.

MESSRS. ZUCCATO AND CO., of 81, Great Queen Street, W.C., exhibit the Papyrograph, an invention which would be specially serviceable to medical officers of health, secretaries of public companies, and other officials who frequently have occasion to send duplicates of reports and other public or private documents. By means of this apparatus any number of fac-simile copies of letters can be taken off from the original in less time than can be done by an ordinary copying-press, and on any quality of paper, in such a way that it is almost impossible to know the copy from the original. For the manifolding of important letters, in which it is necessary to retain

the author's own hand-writing, the invention is invaluable.

THE LONDON WARMING AND VENTILATING COMPANY, of 23, Abingdon Street, Westminster, exhibit some very portable and excellent gas-stoves of every description for cooking and heating purposes. These stoves and ranges are constructed on Southby's patent principles. They claim to have the merit of consuming a very small quantity of gas, to be entirely free from any unpleasant smell, and, whilst cooking a joint of 10 lbs. with a consumption of only one-pennyworth of gas, to effect a saving in the meat itself. The company estimate that, whereas, by the ordinary method of cooking, a 10-lb. joint will lose 2½ lbs. in weight, the same weight of meat when cooked by these gas-roasters will lose only 1 lb., whilst the quality of the meat is improved by the juices being retained, which render it more tender, of better flavour, and more easily digested. Not having tested these gas-stoves ourselves, we must take these assertions for granted. Deducting, however, a large margin from the statements, the most sceptical must allow that these special cooking appliances are economical in every way, as well as being effective in action, whilst their portability is one of the greatest advantages.

For warming and ventilating large rooms, halls, or public buildings, the company exhibits the Gurney stove, which is adapted for use either as a close or open stove, with Woodcock's improvements, having a gas-heating apparatus on Southby's patent, which they claim to comprise the following advantages :—The products of combustion cannot enter the room, as there is no connection between the inside of the stove and the room ; scarcely any heat escapes with the products of combustion, as the exit-pipe never gets hot to the hand ; no chimney is required ; all that is necessary is to take two small pipes, or a three or four-inch pipe containing them, through an outer wall, and these pipes can be taken under the floor ; fresh warm air can be introduced into the room for ventilation, and every part of the room is equally warmed. The exhibits of this company certainly deserve special attention.

MESSRS. CHAS. BALL AND CO., of 21, New Bridge Street, E.C., exhibit the various appliances and inventions of Messrs. J. Decondun and Co., of Paris. These firms have specially devoted their attention to the improvement of all kinds of machinery for the purpose of saving labour in the laundry. To commence at the beginning, their fountain galvanised-iron boiler, with stoves, are exceedingly portable, very efficient, and are great heat economisers. These stoves, with the boilers, are very convenient, can be placed in any room or in the open air with equal facility, and are cheap and durable. By a special and peculiar arrangement the water, as soon as it is heated by the fire, causes a continuous fountain of hot water to rise in the centre and distribute the liquid equally over and through every part of the linen, the heat gradually increasing to the required temperature, and a perfect circulation maintained, which will thoroughly cleanse the linen or material to be washed.

Of a similar character is their patent steaming apparatus, which is capable of boiling or steaming any quantity of linen, quickly and efficiently. Their washing-machines, especially those which are made on the oscillating principle, are simple in action and construction, and durable, whilst very low in price. They also exhibit a rotatory washing-machine, which provides a large inner circulating area.

After washing the drying and mangling follows as a necessary sequence, and in this branch Messrs. Decondun certainly excel. Their patent drying apparatus specially deserves praise. They are made on the semi-rotative principle, and of all sizes. As time and labour-saving appliances we can recommend them thoroughly.

MR. E. SHREWSBURY, of 56 Old Bailey, has specially devoted himself to perfecting gas as a means of heating and cooking, and removing the disadvantages which were formerly incidental to that means of cooking. For this purpose his 'Nonpareil' gas-stove is worthy of special mention. This stove will cook a joint, poultry, or bake bread and pastry to perfection, as was demonstrated at Brighton, where the hungry could feast their eyes on joints cooked and 'browned' to perfection in one compartment and the hot rolls in another part of the same 'Nonpareil' oven. The ovens are entirely free from smell and smoke while in use, and Mr. Shrewsbury states that a dinner can be cooked by these ovens for 1½*d.* He inadvertently omits, however, to say for how many. Mr. Shrewsbury has thoroughly and successfully devoted himself to the utilisation and treating of gas in every way to its fullest extent. Among the minor domestic comforts is a small boiling apparatus ; an improved broiler for chops and steaks ; each fitted with a patent burner, which ensures perfect combustion, whilst the ovens themselves are provided with a special ventilating arrangement. For the boiling apparatus the price varies from 7*s.* 6*d.* to 25*s.*, and the oven sells for 15*s.* 6*d.* The extreme portability and the varied uses to which these apparati can be used must recommend them strongly, and especially so in the summer-time.

The major inventions which Mr. Shrewsbury exhibited were gas-baths and hot-water heating apparatus for halls, houses, and conservatories of all dimensions. Large gas ranges, suitable for large families and hotels. Gas-stoves for heating baths (the Excelsior bath indeed is worthy of Archimedes) ; stoves for conservatories ; a registered tailor's ironing stove ; and lastly, what he specially justly prides himself upon, his newly registered ornamental hot-water heating coil. These coils are constructed on scientific principles so as to give the greatest amount of heat for the smallest consumption of gas, and are ornamental in appearance, occupy a small space, cause a thorough distribution of heat, require little fixing, need no attention, consume very little gas, and supply hot water for an emergency ; and, unless used in a bedroom, there is no necessity for a flue pipe, as not the least smoke or smell is emitted. These stoves are ornamental in appearance, and supply a large radiating surface, which renders them well suited to private and public buildings of every kind, whilst the arrangement for the supply of hot water gives them a double value.

MESSRS. GOUNDRY AND CO., of Upper Thames Street, deserve special praise for the manner in which they have succeeded in compressing tea, by which means they render this very essential article of consumption more nutritious and economical in use, as the full flavour and virtue of the leaf can be readily extracted, and the packets themselves are in the form of compressed cakes, stamped in half-ounce divisions, which can be readily broken

off as required. In order to obtain these results the tea is put under a pressure of sixty tons to the square inch, the effect of this enormous compression being simply to consolidate the tea into one homogeneous mass. The beneficial effect of this operation is very obvious when the tea comes to be 'made,' as it not only goes further but gives a better flavour than a much larger quantity of the ordinary kind would do, and the whole of the virtues are extracted readily. We have proved this by experiment, and can speak confidently of the merits of Messrs. Goundry's system of compression. The inventors, themselves, claim, amongst other advantages to effect a gain of 40 per cent. in strength of liquor. Tea in this form is genuine and cannot be adulterated, and is sold in a way which makes waste impossible.

MR. ABRAHAM, of 16 Elgin Road, Harrow Road, has, according to his own account, effected 'the most wonderful discovery of the age; a perpetual glow without any perceptible cause; an ornament and luxury combined that should occupy a place in every house; the only thorough and economical renovator of impure air in hospitals, school-rooms, surgeries, court-rooms, halls, etc. As a deodoriser or perfumer for the hospital or sick-chamber, it has no equal; at the same time offering employment and amusement to the patient. An entire house may be perfumed or disinfected as desired at the expense of a few pence.' We take this statement slightly *cum grano*. Apart, however, from the bombastic claims set forth, the little perfumer or deodoriser has the merit of being portable, very effective in action, and somewhat novel in principle, and is, moreover, ornamental in appearance.

THE SILICATED CARBON FILTER CO. have a large variety of their special filters on view. The advantages which the company claim for their exhibits are: Purity of filtration, removing all colour, taste, and odour, arising from the decomposition of organic matter, animalculæ, etc., and rendering the most noxious gases perfectly harmless; entire removal of the poisonous salts of lead and other bases, even when in solution; imparting freshness to flat water, by the production of carbonic acid; undiminished power of purifying for several years; no tendency in the filtered water to form any sediment or deposit; material reduction in the hardness of the filtered water; general economy and freedom from derangement; capability of being easily cleaned; impossibility of any water passing in an unfiltered condition; all water, however foul, except sea-water, is rendered by these filters sparkling, wholesome, and agreeable. If the filters of the Silicated Carbon Co. really fulfil all that is claimed for them by their sponsors as above, they certainly are invaluable as water-purifiers. They are made in all shapes and sizes, artistic and otherwise.

Mr. T. MURBY, of 32 Bouverie Street, E.C., has a number of educational exhibits which are of value to the sanitarian. To impress fully the value and importance of sanitary science upon the masses, and those not the least educated, it becomes from time to time necessary to explain the laws of physiology which govern health, and to demonstrate clearly that man is fearfully and wonderfully made. Mrs. Buckton, of Leeds, was one of the first ladies to recognise the importance of this special mode of instruction, aud her example has been widely followed in other parts of the kingdom. To such lecturers Mr. Murby's natural history wall-sheets will prove invaluable. They comprise a series of pictorial diagrams and natural specimens, illustrative of human physiology, zoology, botany, geology, and mineralogy, by A. Boucard, and other eminent professors.

The series contains twenty sheets, eighteen inches by twenty-four inches, comprising 166 diagrams of animals and plants, life size, and thirty-seven natural specimens of woods and minerals, mounted on very stout cardboard, for hanging on the wall.

The series comprise:—Man: respiration, circulation of the blood, digestion. Man: organs of the senses. Vertebrates: mammals, dental system, insect feeders. Vertebrates: birds. Vertebrates: reptiles, fish. Articulates: useful, auxiliary, and injurious insects. Articulates: crustacea, intestinal worms,, annelides, mollusca, radiates (zoophytes). Plants: woods (natural specimens); leaves, flowers; fruits and seeds, germination. *Dicotyledons*: composite and leguminous tribes; umbelliferous and solanaceous; olive, rose, cruciferous and vine tribes; nettle, mallow, and flax tribes. *Monocotyledons* and *Acotyledons*. Geology: study of the formation of the earth (fossils). Mineralogy: minerals employed in the arts (natural specimens).

The series is exceedingly well got up in every way, and sold at a remarkably low price. Mr. Murby has also issued an excellent elementary text-book of physiology.

MR. MCNEIL GREIG, of Agar Street, London. exhibits his safety ventilating trap, which he claims as an absolute cure for the inroads of sewer-gas. But we cannot think that the wastes from baths, housemaids' sinks, and areas, ought to be allowed to enter the same trap as the soil-pipe, because this is not disconnecting these parts of the house economy from the drainage at all, but the very opposite. Some portion of the ordure is certain to remain in the trapping-water; and, as this decomposes the gas must rise not alone up the soil-pipe, but also up that portion of the trap which leads to the bath, etc. The ventilator which is provided will not remove much of the gas, except from that portion of the trapping-water that is immediately underneath it. Although bound to make these few strictures, we must say that Mr. Greig's trap is a very useful one; and where it is advisable to put a trap at the bottom of the soil-pipe, his trap would work very well. But the other wastes from the house should deliver in the open air over a small trap leading to the inlet at the back, and if this be done, the trap can be turned to excellent account. We can cordially recommend the smaller yard-trap.

MESSRS. LEDGER AND CO. show samples of Bagot's extract of meat, which deserves high praise. It is soft and pleasant to the palate, and has been spoken of very highly by the leading public and private analysts. We can recommend it for the following reasons:

The preparation is made by a rapid process from the pure juices of the prime parts of the animals, a few hours only elapsing between slaughtering and completion of the process.

No chemicals whatever are used, and it consists of the soluble parts only of fresh meat, retains the fine meat flavour, and is warranted to keep good in all climates.

The saline taste is derived solely from the natural

salts of the meat, nothing but distilled water being used in the manufacture. It is not in the slightest degree relaxing, as many badly prepared extracts have proved to be.

It is readily soluble in either hot or cold water, or by steam, and will not deliquesce or become mouldy on exposure, will keep unaltered even if put only in paper, and is entirely free from the very decided flavour found in 'Liebig's Extractum Carnis.'

Another very great advantage is the cheapness of the preparation.

MR. T. J. CONSTANTINE, of 61 Fleet Street, exhibits the novel and excellent economical stove or cooking apparatus invented by Captain Warren. By this system of cooking the meat is cooked in its own vapour, and none of its nutritive qualities are lost. The advantages claimed by this system are, that it saves waste and trouble, as the meat, absorbing no water by boiling, the true flavour is preserved; that it makes the most nourishing soup at a temperature of 210°; renders burning, scorching, over boiling, and smoking impossible; effects a saving of two ounces in the pound, or 12½ per cent.; the most delicately-flavoured dishes can be made with ease by inexperienced cooks; meat may be kept hot two hours without spoiling; meat so prepared is invaluable for invalids and persons of weak digestion, the juices being retained and the fibre made perfectly tender. These are great advantages; but looking at the thoroughly scientific and practical principles which Captain Warren has introduced, we believe that the inventor and patentees of these appliances are not claiming too much.

Mr. Constantine's Treasure Range must, to a poor man—or a rich one either, for that matter—be invaluable, as it will, according to the statements made, effect a saving of one half the amount of coal required in an ordinary grate; and not only that, but it will utilise equally well coke, cinders, breeze, and all kinds of kitchen refuse, without smell; is free from dust, dirt, soot, and smoke; may be placed anywhere without brick-setting; is a cure for smoky chimneys, and dispenses with the services of the chimney-sweep by burning its own soot; has no dampers, is perfectly under control, easily managed, and cannot get out of order. These qualifications render it equally valuable to the maid-of-all-work or to the most fastidious lady, as it may be used without incurring the risk of all those petty annoyances inherent to the usual open range.

The prices range from 15*s.*, which would represent the smallest size, to 40*s.* each for the largest size, which has a hot plate 25 + 16½ inches. The 'Treasure' comprises a complete range in itself, including oven and boiler. In view of the high price of coal, appliances which will be the means of effecting any saving deserve special encouragement and support. We may add that the stoves have been highly spoken of by those who have tried them.

Mr. Constantine also shows Dun's patent fire-clay and fuel economiser, by which it is stated that one cwt. of coal can be saved to every ton of coal consumed. The economiser consists of a deeply toothed false bottom of fire-clay, which is made to fit into the bottom of the grate; the shape of the economiser ensures a thorough draught, and hence perfect combustion at the same time that it speedily absorbs and radiates the heat of the fire. All inventions which tend to effect economy of fuel deserve special attention and encouragement.

MESSRS. POTTS AND CO., of Birmingham, exhibit the patent Edinburgh air-chambered sewer-trap, in which they have introduced some improvements. They have abolished the flap trap inside, and have also introduced an inlet close to the wall, which could easily be made to receive the wastes from baths and sinks or rain-water from the roof. But it would be preferable to allow these to deliver spout fashion above such an opening, and not run direct down into the socket of the trap-pipe. There is not a trap in existence into which soil is carried, that is also made to receive the sink wastes, etc., in this direct fashion, but what is subject to an effluvium up the waste-pipe; utter disconnection of these wastes from any trap whatever is absolutely necessary.

MESSRS. THOMAS WALLER AND CO., of Fish Street Hill, exhibited a very complete set of sanitary goods, including cooking, hot-air, and broiling-stoves, gas roasters, and steaming apparatus. These are all of the best description, as may be surmised when the name of the exhibitors are taken into account. Their bath arrangement is very compact and serviceable, which is more than can always be said of these contrivances. The lavatory basins are equally well equipped with all that is needful.

They also exhibit a patent fire-contracting stove, by which the fire can be increased or diminished at pleasure by a simple manipulation of the poker. By the use of this excellent invention the householder can keep up a large or small fire at his option, and can burn his cinders to the greatest advantage. The sliding cheeks of the grate, by which the fire is contracted, are carefully protected by an iron box, and thus the bricklayer cannot disarrange them when setting up the stove. Their patent warming and ventilating apparatus is well worth the attention of architects and others interested in this branch of sanitation.

MR. BENJAMIN LOOKER, of Kingston-on-Thames, exhibited a new terra cotta stove, which consisted of a hollow base, with a central opening, and small apertures around it, upon which an ordinary atmospheric gas ring-burner is placed. Cup pieces, inverted, are then fitted dome-fashion above the base, and these have perforations in them, none of the perforations, however, being exactly opposite to each other. The heat is thus baffled by the system of perforations, and the heated air is deflected downwards.

The stove heats by convection as well as by radiation, inasmuch as fresh heated air is led out of the central opening. We have noticed on a former occasion some others of Mr. Looker's manufactures, and congratulate him upon his stove, which has most of the elements of success in it.

MR. HALBARD'S patent cast iron stench-trap and street gully is exhibited by Mr. Borwell, of Burton-on-Trent, and the advantage of this trap is that it forms three distinct traps, two of which are not exposed to the atmosphere, and which will therefore not be so subject to evaporation. When the trap wants cleansing one of the three divisions can be raised up. The cover to the trap is also shaped like a hopper, and by this means the water in that portion of the trap which is exposed to the air is made less liable to evaporation during the summer. The same peculiarity of shape also tends to prevent the first trap's contents from freezing

during the winter. This trap is one of the most useful exhibits.

THE SPONGY IRON WATER PURIFYING COMPANY, of Oxford Street, exhibit one of their filters. This filtering material has been strongly recommended of late as being very useful in diminishing the quantity of the organic nitrogen and albuminoid ammonia. It is also said to readily decompose organic matter, and remove every trace of lead from the water. There is no doubt that spongy iron will greatly purify water, but will need to be replaced in the filter once in twelve months. The construction of the filter seems to be all that is needed. The bottom filter is filled with animal charcoal or limestone, and we would only add, if the former is to be used, see that it be pure, or the water will be made worse from contact with it.

MESSRS. ROBERT BOYLE AND SON, of London, exhibited, amongst other things, an air-pump ventilator, which is for use on the roofs of halls and public institutions. It has the usual belfry look, and consists of four sections. From whatever quarter the wind is blowing the latter impinges upon the upright plates which are presented to it, and being deflected at different angles inside, the body of the ventilator is compressed; whilst in passing out, it exhausts the internal chambers formed by the upright diaphragms, creating in this way a partial vacuum. The foul air, as in duty bound, will then rush up the shaft to supply the place of the extracted air, and a continuous and powerful upward current is thus secured without any down draught. This turret ventilator is a decided improvement upon those articles of the kind which merely provide for the retirement of the foul air.

MESSRS. MEAKIN, of Baker Street, also exhibited their well-known self-acting sash-fastener and sash-opener, which is now very extensively used for lowering and raising the large plate glass windows in better class houses, and which, unlike all other sash fasteners, can be opened by means of a cord from below, irrespective of the height of the meeting rails. The fastening is unlocked by the act of pulling the inside cords, and can fairly be said to be burglar proof, if any merely glazed window can be called so. By a simple contrivance of an extra locking plate the sashes may be secured, even when opened some few inches for ventilation during the night, and this is a boon which will make itself felt with every householder who can afford these novel and useful articles of ironmongery.

MESSRS. LEDGER AND CO., of Lant Street, Borough, show specimens of the universal disinfectant, the basis of which is permanganate of soda; the virtues of this invaluable material for disinfecting purposes are too well-known to need any further praise.

MR. W. ROBERTS, of Derby Road, Liverpool, exhibits a very simple and expeditious self-acting painting machine, suitable for painting the laths used in blind-making, and also all kinds of mouldings. The idea of a painting machine for large boardings was first broached by a Gloucester firm during the early portion of the Crimean war, and just lately at High Orchard works may be seen a painting machine put up but recently. Painting machinery will not, we think, be readily adapted for large boardings. Mr. Roberts's machine will enable a man and two boys to paint 6,000 lineal feet, or say, 600 lathes per hour, of course without the use of steam power. We feel satisfied that our blind-makers would save 5*l.* per week by every machine in use, and probably were more of these machines in use it would be easier to deal with our painters.

MR. W. H. MOORE, of Arthur Street, East, exhibits an improvement in the way of a patent filter, through which the water to be purified ascends through the filtering media. By this arrangement the filters will last much longer and with better results than in the ordinary case where the grosser impurities of the water are deposited on the upper surface of the filtering bed, and which after a time frequently renders the water worse after filtration than it was before. This contingency, however, will occur in nearly every description of filters, all of which require cleansing and renewing from time to time. Mr. Moore's filters are connected with the service pipe between the cistern and the ordinary tap, without interfering with the usual supply. The water filtrates upwards through the carbon into the air chamber (compressing the air contained therein equal to the pressure of the supply), then up the glass tube into the filtered water chamber ready to be drawn off, the consequence being that, whenever water is drawn from the ordinary tap, the pressure is removed from the underside of the carbon, the compressed air acting simultaneously drives down a portion of the purified water back through the carbon, carrying with it all impurities, which are at once flushed away by the water which passes through the bottom of the filter, and out at the ordinary tap.

MESSRS. GARNHAM AND CO., of Sash Court, Finsbury, show Mr. Harper's Patent Block or Space Train Signalling Telegraphs, which are well worth the attention of every engineer in the kingdom. By the use of the Patent Train Signalling Apparatus it is impossible for the wrong signal to be sent. One wire only is required, and the needles remain unaffected by vibration. There is a system also for entirely disconnecting this instrument at both ends, so that the signalmen must mutually make the signal complete. The drawbacks arising from lightning, earth currents, etc. are thus avoided. The proper mode of insuring safety in railway travelling has recently become a prominent question of the day, and one which it behoves the railway authorities to study.

The patent interlocking instruments for junctions, and the distant signal repeaters, are also arrangements which are certain to insure a most complete method of working junctions. There is also an improved form of bell, and an improved battery; but those interested in electrical machinery and signalling apparatus should examine these carefully for themselves. Messrs. Garnham's communicating signals between passengers and guard are in use on the London, Brighton, and South-Coast Railway.

MESSRS. STEEL AND GARLAND'S Wharncliffe patent register grate is exhibited by Messrs. C. and J. Reed, of North Street, Brighton, and this grate claims to be the simplest of its kind, and with a minimum of fuel gives off the maximum of heat. Of course it is a ventilating stove, cold, pure air being admitted at the back or side, passed through the hot-air chamber, and then sent into the room.

About one pound of coal per hour will heat an ordinary room. There is no doubt that the stoves

which heat by mere radiation permit an immense waste of coal. Compared with some other kinds of ventilating grates, the Wharncliffe stands out very favourably indeed. It must be borne in mind that, like the Thermoson grate, it projects beyond the line of the wall, and the heating surface therefore has more power upon the room.

MESSRS. WARNER AND COWAN, of Ball's Pond Road, exhibited a self-regulating gas meter, which is made on the wet meter system. The common wet meter is subject to variable measure, and the compensating wet meter is not free from objections ; but Messrs. Warner and Cowan's self-regulating drum appears to be a cure for all the faults of the ordinary measuring arrangement, and to have won golden opinions from very eminent authorities. There can be no doubt that up to the present the wet meter has been shelved for many proper reasons, and the dry meter vaunted by all; but now that a perfect accuracy of measurement can be obtained with the wet meter, the latter will soon regain its ascendency, to the benefit of all householders.

MESSRS. FRANCIS AND CO., of Bedford Court, Covent Garden, exhibit their system of electric bells, which is now meeting with great approbation in all parts of Europe. It was originally, we believe, an American idea, and is there used not only in dwelling-houses but in manufactories. The advantages of the electric system is that the wires are not subject to strains. Messrs. Francis have adopted the Manganese battery, by the use of which the battery requires but very occasional attention. We often wonder why this simple method of communicating at a distance is not more frequently used, and even made to act as a system of signalling. As a precaution against thieves the attachment of such bells to the doors and shutters would beat anything we have now in the market. Pneumatic bells are sometimes used, but they are not so perfect, we think, as electric ones.

MESSRS. T. ROWLEY AND SONS, of Brighton, exhibit a novelty in their visometer, which they claim to be a great improvement on the optometer, inasmuch as it tests readily and without fatigue the strength of each eye ; and the mean between each, as indicated by the right and left scales of the visometer, represents the actual strength of the eyes conjointly.

By the use of this instrument spectacles can be suited to the sight with greater exactness and comfort to the wearer than by any other means yet adopted.

It tests each eye separately, and discovers if there is any difference in their focal power or in their powers of adjustment, and indicates the relative power of each eye ; hence a suitable lens is readily and correctly obtained. Thus a distinct image is formed on the retina, and all strain on the optic nerve is obviated by allowing the eyes to work harmoniously together, which in the use of spectacles is the great object to attain.

The visometer tests with equal accuracy both myopia, or near sight, as well as aged, or far sight.

MESSRS. GEYELIN AND CO., of Argyle Square, London, seem to have devoted special attention to the manufacture of soups and milk foods. They have all varieties of portable and readily prepared foods and condiments, done in this manner, including soups of all kinds, mustard, and meat-extract. These are prepared in a tasteful and pleasant manner, each one readily soluble, and retailed at the popular price of twopence per packet.

MR. ELIAS G. WRIGHT, of Portsmouth, exhibited a rotary machine for efficiently straining liquids and for sifting powders. Inside the box are made to revolve any required number of brushes or sieves, and by their means all lumps are broken up, and the material—snuff, or lead-powders—properly and uniformly prepared for use. Its value, as a sanitary invention, lies in the fact that no dust can escape from it when the sifting is going on, nor fumes when poisonous liquids are being mixed. Blood-poisoning has often been known to have followed the common system of open admixture. But of course the machine is fitted for domestic use as well, and for similar purposes is much used, we understand, by brewers in the preparation of their finings.

MESSRS. BELL AND CO., of Oxford Street, exhibited Paris's patent smoothing iron and portable ironing table. It resembles an ordinary kitchen table, with a gas-making apparatus attached, which, however, can be easily removed if desired. The gas is made by mixing 10 per cent. of gas with 90 per cent. of air, and the gas is supplied under a slight pressure from bellows actuated by a treadle. The irons are ready for use in five minutes after the gas is lighted, and may be kept at use for the whole day, at about one penny cost. Where the table can be supplied with common coal or oil gas it is admitted by a tube to a tap from the nearest gas bracket, the air being supplied from the bellows by a straight tine. We have said sufficient, we hope, to direct attention to this very admirable, domestic, laundry-companion. The same firm exhibited some very good washing machines. The Home Washer especially attracted attention, and the various adaptations of it for washing, wringing and mangling were very wonderful.

MRS. AMELIA LEWIS, of 420 Strand, exhibits her patent People's Stove, in which we have felt greatly interested. It is not at all disagreeable in appearance, and as the iron surface is restricted by reason of its economical construction, the overheating of the air is greatly reduced.

After a perfect combustion of the fuel the heat is gathered into the heat chamber, and it is there applied to the cooking utensils which are inserted in the openings of the top plate. Not an inconsiderable benefit offered by this stove is the ease with which it can be attended to, it being raised to about the level of an easy play of the hands.

It can be rapidly lighted ; it is free from smoke, and the expense of the stoves is remarkably small. Complete cooking utensils of every kind for the student-of-cookery's use are supplied if necessary.

Here is exactly what young ladies require who are careful to become useful wives, and here they can roast, fry, stew, and boil all day long if needs be at a ridiculously small cost. But it will be found, we hope, most useful, and be more patronised amongst the poor on the proposed hire system.

MESSRS. KAY BROTHERS, of Stockport, exhibit a novel material which we cannot but consider a step in the right direction, in the matter of a lava, which has already been used for cistern material, drain-

pipes, water-troughs, etc., and is, moreover, an excellent modelling stuff. It runs like lead when crushed to powder and melted in a covered ladle over a slow fire, unites chemically with metal and stone, remains unaffected by the weather, and is sufficiently hard for all common purposes. For cistern material it means a saving of about 85 per cent., as compared with wood lead-lined.

MESSRS. BROWN AND CO., of London, have here exhibited their permanent system of watering the streets of towns, public parks, and market gardens. There are, as we all know, two rival systems extant for watering the roads, Bayley's and Brown's. Were the plan of Messrs. Brown and Co. once laid down in a town, a great expense must necessarily be saved in carts and horses. The question, however, is, does the system act perfectly where it has been laid down, and a great deal has been said on both sides of the question.

It is probably too early to form a solidly grounded opinion upon the wisdom of laying it down in our streets, but we think no one can hesitate in declaring it admirably suited for the watering of public parks.

MR. BARTON, of Boston, Lincolnshire, has attained a very high degree of perfection in his semicircular stoves and ranges. This arrangement gives a large heating and cooking surface combined with economy of space. The saving which these ranges effect on the consumption of fuel is very remarkable.

It is an ascertained fact that five inches in height of burning coal upon a small angular shaped grating is sufficient for general purposes to work the whole range properly. By bringing this very small fire near to the hot plate, a kettle will boil quickly when the fire is first lighted, and in hot weather the range is available for every cooking purpose, with the smallest possible consumption of fuel; at other times the fire is enlarged for roasting before it, or for warming. When not cooking, by lowering the fire near to the hearth without using the roasting bars, it will burn like a cheerful sitting-room grate for some hours without attention. The special ventilating dust flue is in connection with this range, which carries away dust, steam, and the very unpleasant smell which arises from cooking.

These appliances have been severely tested and reported upon by Captain Webber, R.E., who speaks very highly of their capability. They are made in all sizes and patterns, and their appearance is pleasant and cheerful; this, coupled with the fact of their great economy and utility, should render this form of stove a general favourite. Mr. Barton's cottage cooking grates are also well worthy of notice from their utility and economy. The grates are suited for dwellings of the working classes, for nurseries, butlers' pantries, and as auxiliary and summer cooking grates for houses in general. The cost of fuel with the cottager cooking stoves is from 9*d.* to 1*s.* per week, allowing them to be in use fifteen hours per day, with coals at 16*s.* 6*d.* per ton.

Stoves are also made on the ventilating hot-air principle, and have ample arrangements for the heating and warming of houses and mansions of all sizes.

We will notice Messrs. Doulton's and Messrs. Stiff's exhibits next week, and especially Mr. Banner's valuable inventions.

THE
SANITARY RECORD.
SATURDAY, OCTOBER 23, 1875.

TO SECRETARIES OF SANITARY ASSOCIATIONS AND KINDRED SOCIETIES.

The Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers read before the members of any sanitary or kindred association.

MEAL TIMES.

IV.

Tea and Supper.

AFTER dinner is the natural time for repose of body and mind. Then are the hours for laughter and frivolous conversation, political discussion, philanthropy, poetry, the drama, music, religious and scientific meetings, legislation, dancing, billiards, whist (for low stakes), in fact, any occupation which draws us out of ourselves and interests us rather in the affairs of other people than our own. Care for one's dear self is always carking, and has a carking influence on the solar plexus. If those stern economists who grudge as lost every minute of our short lives not spent with a definite aim should ask, 'What are you careless mortals doing with your precious moments?' we would answer, 'Digesting! If that is not an important occupation, we do not know what is.'

It must be understood, however, that repose does not include the excess of repose, sleep. Whether from the diminished amount of oxygen absorbed, or from the torpidity of even reflex and unconscious nerve action during sleep, digestion is certainly very much retarded by it. And, moreover, sleep taken while the stomach is full, is unrefreshing, excites abnormal feverishness and perspiration, and in some cases seems almost a sort of coma. We can judge how little it contributes to health by the confusion, languor, and sometimes headache, which are experienced on waking.

It is especially the young who seem to suffer from sleeping after dinner. Old persons can often do it with impunity; whether it is that the digestive fever is less strong in them, and the circulation less irritable; or perhaps from the mere force of habit they have got inured. But some ancients tell us that their night's sleep is sounder for not resisting a nap in their chair at this time. It is difficult, however, to credit this idiosyncrasy, and it may generally be set down as one of the fallacies of laziness.

In the course of the evening, an hour or two after a full meal, a diluent favours the solution of the

food. Tea is the most popular form in which it is taken, and probably is as suitable as any that can be devised. To those who think the nervine breaks their night's rest, or whose taste disinclines them to it, a glass of water, a Neapolitan ice, or a Macedoine of summer fruit, an orange, or a bunch of grapes serves the purpose as well. John Milton used to take an olive, a glass of water, and a pipe of tobacco —a combination calculated to keep fresh the memory of sunny evenings with Diodati, Manso, and Galileo, ere gout, Scotchmen, and *gutta serena* had begun to trouble.

As a rule everybody ought to be in bed and asleep by four hours after the end of dinner; delicately framed persons, overgrown persons, hard-worked persons, young persons and women, sooner. Invalids also come under a different regimen altogether. By this time digestion of a heavy meal is about two-thirds completed, and the remainder is completed during sleep. If the stomach is taken to bed empty, it becomes gently, but firmly, importunate and prevents sleep. So that if the natural bedtime is much exceeded, as each one must judge by the clock of his own appetite, it is better to take a light supper before retiring. Social gatherings of various sorts often pleasantly and healthily detain us later than our habitual domestic happiness. And they often instinctively wind up with a supper. No meal can be better timed, and if the constituent materials be equally well chosen, none wholesomer; but as these papers are on times and seasons, and not on the qualities, of food, that large subject must be left uninvaded.

Going to bed with the stomach empty is a frequent source of restless nights, especially with elderly people. Even after a late dinner it will be found beneficial in some cases of sleeplessness to take a light repast immediately before bedtime. Bread and milk, or rice milk, or a soup, generally answer the purpose best; but in truth it is the quantity, not the quality of the solids taken in this emergency that effects the desired object.

METROPOLITAN PUMPS.

WE see with great pleasure that in selecting the foul water of Aldgate pump for public condemnation, we have, thanks to the susceptibilities of the believers in that great civic institution, succeeded in arousing public attention to the polluted waters furnished by the metropolitan pumps. We regret to find that the condensed account which has appeared of Dr. Sedgwick Saunders' report to the Commissioners of Sewers on the Aldgate and other city pumps gives the impression that these particular pumps are pure. Our published analysis proves the contrary, and we are glad to learn that the text of Dr. Saunders' report has been entirely misinterpreted. He joins in our condemnation of the water which they yield as dangerous, and the result of the publicity which has been given to our statements, and to the impressions which they have made upon the public mind will, we believe, be seen shortly in the closing of a number of the pumps generally throughout the metropolis. The published letters of Drs. Frankland and Letheby show how necessary this is, and we shall next week publish a further contribution to the history of metropolitan pump waters.

Notes of the Week.

THE Artisans' Dwellings Act is about to be put into force in Birmingham. The town council has agreed to a report by the improvement committee, and ordered the preparation of a scheme. The suggested operations are estimated to cost half a million sterling.

PRESENTATION.

MR. W. YOUNG HARDIE, late surveyor, Bangor, is to be presented by his friends there with a splendid silver service, in recognition of his services and ability, on being appointed surveyor to the Accrington Urban Sanitary Authority.

'PRESERVED PEAS.'

AT the Marlborough Street Police Court, Mr. Lingner, No. 46, Old Compton Street, was summoned for selling as unadulterated a can of preserved peas, the said peas being adulterated with crystallised sulphate of copper.—Taylor, inspector of nuisances, said on September 16 he purchased a tin of preserved peas at the defendant's shop, at the time stating they were for analysis. He took a portion of the peas to the analyst, and sealed up the remainder. The certificate he produced was from the analyst.—Dr. Evans stated that to eat such peas would be injurious to health. A large dose of the article with which the peas were adulterated would cause vomiting, but small doses continuously taken would certainly prove injurious to health. The tin bore the label 'H. Mercier, petits pois fins, Paris.'—Mr. Knox having ascertained that the principal object of the prosecution was to prevent the sale of injurious articles, asked the defendant what he had to say to the charge.—The defendant replied that he sold the article as he received it. Fined 20*s*., and 2*s*. costs.

INTERNATIONAL SANITARY CONVENTION.

NEGOTIATIONS are, we understand, in an advanced state of progress between the Governments which participated in the late International Sanitary Conference of Vienna for the conclusion of a treaty based upon a draft prepared and submitted by the Austro-Hungarian Government. The object of this convention is to create an International Commission on epidemics charged with the study of the origin and means of protection from cholera and other epidemic diseases. This committee would be composed of physicians designated by the signatory powers of the treaty; the expenses of organisation would be borne in common, and would not exceed 10,000*l*. (250,000 francs). The participation of each would be regulated according to the number of the population, for one moiety of the sum, and according to the tonnage of the mercantile marine for the other. On this basis the different states would be divided into three categories. The first comprising six states: Austro-Hungary, France, Germany, England, Italy, Russia, each of which would pay for its share, 31,038 francs; the second, composed of four states: Spain, The Netherlands (including Luxemburg), Sweden and Norway, Turkey, each paying 10,784 francs; the third, comprising nine states: Belgium, Denmark, Egypt, Greece, Persia, Portugal, Roumania, Servia, Switzerland, each contributing 2,293 francs; total, 250,000 francs.

ALDGATE PUMP.

OUR contemporary *Punch* has followed in an able manner the lead which we ourselves gave anent the Aldgate pump in particular and London pumps in general. We quote the following from this week's issue of our playful and powerful contemporary :—

'A GENERAL SHUT UP.
(Aldgate pump included.)
O'er 'Change still hangs the fatal spell :
Clerics and spinsters Turkish sell :
Egyptian drafts, too, downward jump,
And none may draw on Aldgate pump.'

So mote it be !

STATE MEDICINE EXAMINATION.

THE following gentlemen passed their first examination in State Medicine, held at Cambridge on the 14th.

Examined in Part I. only. Approved.—Simpson, J., M.D.

Examined in both Parts. Approved.—Bird, P. Hinckes, F.R.C.S. ; Britton, T., M.D. ; Carpenter, A., M.D. ; Cunningham, J., M.B., Cambridge ; Drew, S., M.D. ; Dunlop, A., M.D. ; Earle, B. N., M.B. ; Fosbroke, G. H., M.R.C.S. ; Harrison, C., M.D. ; McBeath, W., M.D. ; Mason, H. H., M.R.C.S. ; Morison, J., M.D. ; Nicholson, E., M.R.C.S. ; Phillips, H. H. E., M.D. ; Saunders, C. E., M.D. ; Steele, S. T., L.R.C.P., Edinburgh ; Swete, E. H. W., M.D. ; Turner, G., L.R.C.P., London ; Underhill, A. L., M.B., Cambridge.

G. E. PAGET,
A. W. BARCLAY.
E. A. PARKES,
JAMES DEWAR,
} Examiners.

Cambridge, October 14, 1875.

NORTHERN COUNTIES ASSOCIATION OF MEDICAL OFFICERS OF HEALTH.

THE Autumn meeting of the Association was held in the St. John's Library Room, Keswick, on October 6.

The chair was occupied by the President, R. Elliot, M.D. (Carlisle), who, after a short introductory address, called upon the Secretary, Henry E. Armstrong, M.R.C.S. (Medical Officer of Health, Newcastle-upon-Tyne), to read the minutes of last meeting, which were read and confirmed.

The following gentlemen were nominated for election : As members, J. Mackie, L.R.C.S., Medical Officer of Health, Darlington (R.S.D.). As associates, J. W. Eastwood, M.D., Dinsdale Park ; G. H. Philipson, M.D. ; Luke Armstrong, M.D., Newcastle-upon-Tyne ; and A. A. H. Knight, M.D., Keswick.

After the completion of the routine business of the meeting, on the motion of J. M. Fox, M.R.C.S. (Medical Officer of Health, Cockermouth), seconded by J. Spear, M.R.C.S. (Medical Officer of Health, South Shields), H. J. Yeld, M.D., (Medical Officer of Health, Sunderland), was elected president-elect of the Association.

The following papers were read :

'On the Results to be expected from the Carrying out of the Artisans' Dwellings Act ;' by H. J. Yeld, M.D. ; 'On the Powers and Duties of Medical Officers of Health,' by J. M. Maclagan, M.D., Medical Officer of Health, Hexham, P.S.D. ; 'Notes on Food Inspection ;' by Henry E. Armstrong, M.R.C.S. ; 'Two Years' Experience of the Cockermouth Village Closet System ;' by J. M. Fox, M.R.C.S.

The reading of each paper was followed by discussion.

'THE CLEANEST TOWN IN ENGLAND.'

TAUNTON has been for a long time considered to be—by its inhabitants, at least, if not by the world at large—'the cleanest town in England' ; and Tauntonians are accordingly just now greatly concerned on account of the fact that two persons in the town have died of typhoid fever—the victims being policemen, and the active cause of the fever being the presence in the town of a filthy slaughter-house, which has not secured a sufficient amount of attention on the part of the board of health. The offending slaughter-house keepers appeared last week before the Taunton Bench, on an adjourned summons, tardily taken out at the instance of the local board of health. When the summons was first heard the local board did not even take the trouble to send a representative to the court. But the magistrates appeared to take a very lively interest in the case—doubtless, because of the fact that the victims of sanitary neglect were policemen. One of the justices—Mr. R. A. Kinglake—condemned the neglect and indifference of the sanitary authorities, remarking that two policemen were dead, and another man was sickening for the fever. On the final hearing of the case it was stated that the slaughter-house keepers had shown diligence in taking means to cleanse their premises since the notice to do so had been served upon them ; and in consideration of this they were condemned in costs, but were not fined. The bench, however, censured the board of health for its great negligence. These cases of fever have attracted an unusual amount of attention, and have put Tauntonians quite in a 'flutter,' because the reputation of their town for general salubrity and exemption from fevers has hitherto been untarnished.

FRESH WATER AT SEA, AND PLENTY OF IT.

THE idea of making the ocean a great reservoir for the supply of fresh water on board ship is not a new one. It has been realised with more or less success by several ingenious inventors, and at this moment there are sundry contrivances in existence for distilling sea-water. Few men, however, have done more practical service in this direction than Mr. Graveley, of the East India Road. He has, for years past, devoted attention to the subject, and has now made it an almost exclusive speciality. The latest description of apparatus which he has invented for the advantage of those who 'go down to the sea in ships, that do business in great waters,' is one which combines within itself effective arrangements for pumping up sea-water, distilling it, aërating the products of such distillation, baking loaves of bread, and cooking food of all kinds. These operations are performed simultaneously, when so required, and the furnace, condenser, pipes and valves of the apparatus are arranged with such simplicity of detail as to demand only ordinary and unskilled attention.

The inventor has indeed contrived to produce a machine which, when placed, say on board an emigrant ship, becomes a 'servant of all work,' and renders far more willing and effective aid than is usually obtained from such 'helps' as they. Setting aside, for the moment, the question of the sanitary and social value of the distilling and cooking apparatus, which must be manifest to all, let us glance at the contrivance from a commercial point of view.

In this aspect no doubt ship-owners and agents will regard it. They cannot fail to see, however, that their interests in this case go hand-in-hand with the welfare of the passengers and crews on board their vessels. The ordinary course on board sea-going ships in making the necessary provision for long voyages is to lay in a large supply of water in square iron tanks. These are deposited in the holds of the vessels, and they occupy space that can ill be spared, and that ought to be occupied by merchandise. The pecuniary loss thus entailed on the owners and charterers of ships is palpable.

Were the vessels, on the contrary, furnished with apparatus such as that referred to above—and which are neither costly nor complicated—this sacrifice of space and of profit would be averted. The saving effected in this way would, in fact, soon pay for the improvements, whilst both passengers and crew would gain in health and in comfort. Thus in all ways the introduction of the distil-

ling and cooking machinery would be attended with advantage. The distilled water, when aërated, as it is during the process of distillation, is found to be anything but of a 'dead' character, and is free altogether from saline influences. Its superiority to the stagnant fluid stored in tanks is beyond all question, whilst the supply is unlimited.

THE SANITARY CONDITION OF ABERYSTWITH.

IN the table of mortality statistics in fifty English seaside watering-places, relating to the second quarter of this year, which we published about two months since, the annual death-rate in the borough of Aberystwith was shown to be equal to 26·7 per 1,000, no less than 16 per cent. of the deaths being referred to the seven principal zymotic diseases, in consequence of the fatal prevalence of measles. The zymotic rate was higher than in any other of the fifty watering places during that period except Whitby. Now that the visitors' season of 1875 is virtually over, we are glad to see that an influential local paper, the *Cambrian News*, has directed attention to the unsatisfactory condition of this watering place It may be hoped that the urban sanitary authority may be stimulated to exercise the powers they possess under the Public Health Acts of 1872 and 1875 for the benefit of the health of the town. The *Cambrian News* says: 'Pigs once more prevail in great force, sewers are as offensive as formerly, the streets are as dirty as in the old times, the water-supply is still defective; in fact, Aberystwith is going backward instead of forward in sanitary matters.' If, as our contemporary asserts, the drainage is defective, the water-supply insufficient, and the town abounds with unsavoury nuisances, the high death-rate in the town, and the large percentage of zymotic or preventible deaths, is fully accounted for. A watering place that has not yet banished its pigs must indeed be in a stage of sanitary progress which is more primitive than hopeful. The next eight months should be utilised by the sanitary authority in putting this borough into improved sanitary condition, or else the prosperity of the town as a watering place may be seriously affected, and the results of the season of 1876 will point the moral of a false economy in sanitary matters. Each season the holiday public becomes more critical in respect of the sanitary reputation of health resorts; and, in spite of all attempts to dissuade them from the conviction, there is a wholesome and sound belief now pretty generally adopted that where the death-rate is high, and the proportion of zymotic diseases excessive, all cannot be right. In thirty-seven sea-side watering places the Registrar General has reported that the death-rate from all causes in the second quarter of this year averaged only 20·1 per 1,000, and the zymotic rate 1·5. In Aberystwith, as we have stated, the general death-rate was 26·7, and the zymotic rate 4·3. These facts speak for themselves.

THE USE OF GUNPOWDER IN COAL-MINES.

A CONSIDERABLE amount of discussion has recently taken place in the colliery districts as to the employment of gunpowder in coal 'getting.' Some authorities, regarded as eminent in relation to operations performed in the world underground, denounce altogether the use of explosives for the purposes of coal-mining. Others advocate a limited and judicious application of the blasting process, and the working colliers themselves, or many of them, are favourable to what they term the 'firing of shots' in coal-pits. The question is, no doubt, beset with difficulties; and of these not the least is the apparent conflict of interests between coal-masters and colliers. The latter have to work in the pits under disadvantages of a variety of kinds, and in presence of risks of a nature which are only made less appalling to them by their own familiarity with danger. It is natural that men so employed should resort to all available means for increasing the products of their exertions whilst in the pits, and this they undoubtedly do very frequently in the most indiscreet way, and at the imminent peril of their own lives and of the lives of others. The coal-mine owners are at fault to some extent in respect of their non-introduction of rules and precautions sufficiently stringent and effective for the protection of work-people from the consequences of their own recklessness, and they, too, are much swayed by the impulses of self-interest. Thus it is that both parties to the contract—employers and employed—regard practical and social problems from antagonistic points of view, and are therefore not likely to agree as to the best methods of solving them.

Our own decided opinion is that, whether in respect of the use of gunpowder in coal-pits, or of the introduction of mechanical and other improvements, little good will be effected until all parties—owners, managers and men—see clearly that whatever would appear to diminish risk should be adopted. This happy consummation will, no doubt, be arrived at some time, and then the public mind will cease to be shocked by accounts, constantly repeated, of colliery accidents, and details of their contingent horrors. The death-rate by casualties among colliers is at present six times as great as that from violence among the whole population of Great Britain, including suicides, homicides, and the dangerous occupations. As proof of the extreme risks run by the unfortunate class in question, it may be stated that insurance companies charge eight times the ordinary premiums for insuring the lives of colliers! This last fact ought to tell eloquently in favour of better legislation, better management, and, above all, the introduction of better mechanical arrangements for the saving of life in our coal-pits.

THE CHIMNEYS REGULATION AND CHIMNEY SWEEPERS' ACTS, 1840 AND 1875.

WE have been requested by the Earl of Shaftesbury to publish the following, which draws attention to the generally neglected Act of 1840, which regulated the construction of chimneys. Lord Shaftesbury thinks that it would be advisable to bring the provisions of this Act more prominently under the notice of builders and surveyors.

These are as follows (3rd and 4th Vict., chap. 85, sect. vi.):

'And whereas it is expedient, for the better security from accidents by fire or otherwise, that the improved construction of chimneys and flues provided by the said Act be continued. Be it enacted, that all withs and partitions between any chimney or flue, which at any time after the passing of this Act shall be built or rebuilt, shall be of brick or stone, and at least equal to half a brick in thickness; and every breast-back and with or partition of any chimney or flue hereafter to be built or rebuilt shall be built of sound materials, and the joints of the work well filled in with good mortar or cement, and rendered or stuccoed within; and also that every chimney or flue hereafter to be built or rebuilt in any wall, or of greater length than four feet out of the wall, not being a circular chimney or flue twelve inches in diameter, shall be in every section of the same not less than fourteen inches by nine inches; and no chimney or flue shall be constructed with any angle therein which shall be less obtuse than an angle of one hundred and twenty degrees, except as is hereinafter excepted; and every salient or projecting angle in any chimney or flue shall be rounded off four inches at the least, upon pain of forfeiture, by every master builder or other master workman who shall make or cause to be made such chimney or flue, of any sum of not less than ten pounds nor exceeding fifty pounds. Provided, nevertheless, that notwithstanding this Act chimneys or flues may be built at angles with each other of ninety degrees and more, such chimneys or flues having therein proper doors or openings not less than six inches square.'

The police are empowered by the Act of 1875 to enforce the above provisions of the Act of 1840, without prejudice to the right of any other person to institute proceedings thereunder. The Act applies to England and Ireland.

THE SOCIETY OF MEDICAL OFFICERS OF HEALTH.

THE newly-elected President of the Society of Medical Officers of Health (Dr. Buchanan), at the first meeting of the session on Saturday last, paid a well-deserved tribute of respect to the memory of the late Dr. Ross, medical officer of health for St. Giles'. Like many other medical men have done, he literally died at his post, whilst the impress of his earnest work in the cause of sanitary science will remain. A general expression of sympathy for the family was recorded. It was also suggested that some more tangible testimony in recognition of Dr. Ross's great talents and exertions should be inaugurated, especially as it was generally understood that the family were not well provided for. The consideration of this latter proposition was, however, postponed for the present, on the ground that, although the above fact might be known privately to many, the Society itself had received no intimation of an official nature on the subject.

At the same meeting Dr. Tripe suggested that every member of the Association should be requested to send a copy of their reports for the benefit of the library. This was an excellent suggestion, inasmuch as the collection of these reports will form invaluable information and data for the future history of the rise and spread of epidemics in different parts of the country.

Dr. Morgan, medical officer of health for Neath, in the course of some remarks on Dr. Buchanan's address, suggested that, as the members of the British Medical Association had an organ of their own, in which their proceedings were recorded in full, the various societies of medical officers of health in different parts of the country should combine with a view to establish a medium for the special publication of the papers and proceedings of these societies.

INFECTION FROM SCHOOLS.

THE medical correspondent of a daily contemporary points out, as we have ourselves frequently done, the necessity of a better system of medical supervision of schools than is at present in vogue. In their zeal to secure a full attendance, the School Board visitors appear often to forget the well-known fact that discretion is the better part of valour, and especially so in the matter of infectious diseases. It would be well to remind such over-zealous school inspectors that as parents are legally liable for sending infectious children to school, they themselves, morally if not legally, render themselves liable for the sickness which may arise from the consequences of such conduct as the following communication from an M.D. bears witness to.

'Apropos of compulsory school attendance, permit me to relate a case, and, *ab uno disce omnes*, their name is legion. The children of a family which I usually attend have lately been suffering from scarlet fever of a severe type, and, as a natural consequence, have been absent for some time from the board school, where they are in the habit of attending. The visitor called on the mother during the week to learn the cause of their absence, of which she was informed. "How long had they been ill?" "Some ten days; one was then very bad." "One was nearly well?" "Yes—at least, was much better." "She must be sent to school again immediately." The mother replied that she did not think it would be right to send her, as she would probably convey the infection to the other children in the school; and, upon the visitor insisting, positively refused to allow the child to attend for the present, The visitor, finding her determined, left, threatening to take further proceedings.

'Yet it is a matter of wonder why scarlatina, etc., have lately been so much on the increase. Often I have been horrified, on calling to see children barely convalescent from scarlet and other fevers, to hear that they were at school; and, on inquiring what could have prompted the mother to send them, have been informed that the school board visitor had been, and had insisted on their resuming attendance at once.

'Surely school board visitors are not always such ignorant persons as not to be capable of being taught that scarlet fever is a deadly and most infectious disease, and that it is not safe for a child to return to school for at least a month after the final disappearance of the disorder from the family; and the same may be said of measles, whooping-cough, typhus, and chicken-pox, all of which, to my certain knowledge, have been propagated by the ignorance of hyper-zealous visitors causing the compulsory attendance of children at school during, and even before, the period of convalescence, from one or other of the above enumerated maladies.'

Report.

MEDICAL OFFICERS OF HEALTH ASSOCIATION.

THE first meeting of the session for 1875–6 of the Society of Medical Officers of Health was held on Saturday evening, when the President, Dr. Buchanan, delivered an introductory address 'On some Directions of Scientific Work by Medical Officers of Health.' After recapitulating the advantages which the Society afforded, and enumerating some important papers which would be read during the session, he showed how officers of health, while pursuing their everyday functions, could habitually assist in the advance of sanitary knowledge. These officers were working under every variety of circumstance, in London, in large provincial towns, over large areas of England, over small districts only, each sort of circumstance presenting its own opportunity for adding to the general stock of information. In the smaller rural districts, where the health officer comes into more exact relation with his people, and where the surroundings of these people can be more precisely learnt than is possible in town districts, special opportunity is given for investigating some of those mixed questions, with regard to the nature and causation of disease, which have been the puzzle of sanitary students working (as hitherto they have only been able to work) among large communities. Here the officer of health can learn, and record for general use and future comparison, the precise conditions which have attended particular occurrences of disease. The town officer of health, on the other hand, has the advantage of dealing with large numbers, and has his own facilities for applying statistical methods to the analysis and differentiation of the conditions which may affect health in his district.

To all health officers, whether working in town or country, there come occasions when ordinary experience is at fault, and when they have not an answer ready to the vulgar fatalism of those around them. These, beyond question, are the occasions when exact and searching investigation may be expected to gain its reward. Among the various directions of inquiry in which scientific health officers may engage, one of the most important has reference to the means by which the so-called zymotic diseases originate and spread.

One or other of these diseases is not unfrequently observed to occur under conditions which are not entirely in harmony with current beliefs about their production.

In the case of typhoid fever, for example, the disease is sometimes seen in remote houses, apparently shut off from all chance of infection; and the first impulse of the doctor is to say that the disease must have had its origin *de novo* in the filth about the place. Evidently, repeated observations of the most exhaustive character are wanted before this can be affirmed. Often in the records of such

cases the possibility of dangerous material passing a long distance through a soil or along a stream has been overlooked, or some channel for the conveyance of specific infection has not been discovered.

If we consider how unintelligible a dozen years ago were those many wonderful outbreaks of typhoid which are now traced to the agency of milk, and how all of them were liable to be regarded as of *de novo* origin, we shall better apprehend the caution with which it is still necessary to proceed before we can affirm the adequacy of common filth conditions, without the material of an antecedent case of fever, to originate the disease. Even if that material could with certainty be affirmed to be absent, we should still be only at the entrance to other important problems, with reference especially to the nature of all conditions differentiating the locality and time of fever occurrence from other localities and times bearing an apparent resemblance to them. No one could be so fit to pursue these studies as the medical officer of health.

Scarlet fever is another disease which frequently presents difficulties which the sanitary inquirer is in a position to unravel. In ninety-nine cases out of a hundred there can be no doubt that its propagation is by direct communication between susceptible persons and infected persons or things. Even these common cases give opportunities for observations which are much needed for practical purposes, as with reference to the period at which the disease assumes its contagious character, and to the circumstances which influence the retention of contagion in houses and articles of clothing, and so on—observations which can be made by all medical practitioners. But there are other phenomena of scarlet fever which belong to a wider field of study; for instance, the circumstances which cause an epidemic in one place to have a mortality of 4 per cent. of attacks, and in another a mortality of 40 per cent. The occurrences of scarlet fever when no direct source of infection can be heard of deserve particular examination with reference to unsuspected means of spread, and to possibilities of new production. Already we know of scarlet fever being distributed, like typhoid, by the milkman, and of dinner parties from which the guests have carried away the malady. We have been led to consider whether, beyond the human economy, we may not find some hitherto unknown method of conveyance, or some fresh origin of the disease. On such points the officer of health has again the best opportunities of adding to the store of knowledge.

After some further illustrations of his subject, taken from other diseases, Dr. Buchanan continued by pointing out that the greater the interest which the medical officer of health takes in the scientific aspects of his duty, the more will other practitioners come to take a kindred interest in the investigation of problems of causation, and of means for the prevention of disease; and thus the health officer may enlist the whole profession as his fellow-workers, to the great advantage of science. All practitioners ready to make use of their daily opportunities should find in him their most competent and friendly adviser; and pathological science, in its turn, may be expected to gain much from such an alliance. In the organisation that shall see the health officer working towards these ends, with the cordial co-operation of his professional brethren, will be found the best consolation he can receive for his inability to enlighten vestrymen and boards of guardians.

A large portion of the address was devoted to the consideration of epidemic diarrhœa, and Dr. Buchanan indicated various lines of observation and inquiry which were open more especially to sanitary workers in large towns, and which might be expected to yield information valuable as well to the pathologist as to the health officer. He asserted that, beyond a few inferences respecting the dependence of certain forms of diarrhœa upon filth, under conditions of summer heat, little was known about the origin or nature of this complaint, although it proves fatal to many thousands of children every year in England. By study of the records of diarrhœa, non-fatal as well as fatal, in former times as compared with the present time, and in one place as compared with another, much might be learnt as to the conditions of its occurrence; and, by exact examination of the surroundings of particular cases, another set of facts of equal importance might be obtained. Such studies and inquiries came especially within the province of the health officer; and the analysis and accumulation of them, for the use of other workers, were among the chief functions of the society.

A short discussion followed, in which Dr. Tripe, Dr Morgan, Neath, Dr. Price Jones, and Dr. Little took part, and the meeting concluded with a vote of thanks to the president.

Correspondence.

'THE GOUX SYSTEM.'

(*To the Editor of the* SANITARY RECORD.)

SIR,—In reply to H. H. P. in your impression of the 16th inst., I beg to say that 'the queerly called Goux system' referred to by him is taken from the surname of the French gentleman who patented this deodorising and absorbent method of lining the receptacle used in the process spoken of by Mr. Haviland.

Had Mr. Haviland given a complete system of sewage disposal when he referred to his plan of collecting excreta, he would have soared into the regions of engineering, where he would have been open to question; moreover, he is aware that the requirements of different localities are so varied, that no single system can be applied to every place. I am confident that he looks upon the Goux system as one great factor in the problem of sewage disposal, and fully believes that, for economy, simplicity, and sanitary effect it is unequalled, as there is no machinery. Its success depends upon the man appointed to scavenge, and not upon the persons using the seat, therefore neither the scoop would be required, nor the pussy cat (so wittily referred to) imitated, each time the closet is used.

If the writer is (as I imagine) a servant of the public who wilfully shuts his eyes to the merits of all other systems except the one he advocates, viz. the water-closet system, the sooner he retires and makes room for a more enlightened public officer the better it will be for the public generally, and sanitation in particular. The great obstruction to improvement in this branch of art and science is the wilful blindness and contrariness of sewage doctors, and their system of ignoring all other plans than their own. I am inclined to think that your correspondent does not know the principles and practice of the Goux system; if so, and I have been mistaken in attributing his objections to prejudice instead of ignorance, I beg to inform him that the manipulation is so simple that if he thinks it worth his while he may see the receptacle of one week's excreta from a family of ten persons removed, and the one to follow it packed and placed in one minute.

In England we have thousands of places where there is either a deficient water-supply, or where the towns and villages lie below the required outfall. In such places and in all riparian districts the Goux system is especially applicable, so much water not being required for daily use, and at least 80 per cent. of the nitrogenous matter is kept from the sewers, thus less purification is required at the outfall.

I do not admit that the system I represent is not applicable to large towns, as in Halifax, the most difficult town in England to work, there are 3,125 privies or closets close to the doors of the houses, and, in many cases, abutting upon the public thoroughfares; these have all been built or altered at the option of the owner, and are scavenged in the working-day between the hours of 8 A.M. and 6 P.M. without offence to the public.

In page 282 of your last week's issue you have kindly said that I am aware of all sewage systems having their

respective merits; this I fully endorse, and after nearly forty years' experience in all branches of agriculture and engineering, I unhesitatingly say that where cost is not an object, the water-closet, properly constructed with Banner's traps and ventilators, is much nicer and more comfortable than any other system yet brought before the public.

Unfortunately, where one gentleman can afford to pay for the construction and consequent repairs incidental to the water-closet system, there are hundreds who cannot. In such cases the Goux Company comes to the rescue, and does what none of its predecessors have done, viz., for a nominal sum supply license in perpetuity and a set of sanitary appliances devoid of mechanical action which, with ordinary care, will last seven years.

Trusting you will excuse this trespass on your valuable space, I remain, your obedient servant,

THOMAS MASON,
General Manager,
The Goux Sanitary Company,
2 Westminster Chambers, S.W.

SIR,—In reply to the able but facetious H.H.P., permit me to point out that the 'Goux' system is in no way antagonistic to the water-carriage system, but rather a helpmeet or handmaiden.

There are thousands of localities in which for many years to come water-closets are impossible and impracticable luxuries. And in many of these localities were H.H.P. to attempt his 'pussy' manœuvre he would hardly find ground in which to dig his hole, or from which to scratch the mosaic covering of earth, which, according to H.H.P., is pre-adamitic in origin.

The advantages of the 'Goux' system are that, without the expense or uncertainty of machinery, a maximum of decency and comfort is attained with a minimum of expense.

Were people left to themselves to act as earth croppers and distributors, as suggested by H.H.P., there would be nothing done at all, as, unfortunately, all do not inherit the cat-like sagacity of your correspondent.

Experience has taught us that scavenging and disinfecting to be effective and thorough must be systematic, and to be systematic they must be undertaken either by sanitary authorities themselves or by contractors duly responsible to such authorities for the performance of their engagements.

H.H.P. hardly seems aware that the 'Goux' closet is one in which the absorbent and deodorant is contained in the receptacle itself, and that neither mechanical nor manual assistance is required. Had I a town or a village under my control I should apply the Goux system to it, and I am sure a large proportion of 'filth' diseases would be for ever banished.

With regard to the 'Goux' and other systems of conservancy, you, sir, in your remarks on the sanitary exhibition at Brighton, seem to me to have sounded the right key-note when you urge that the widely varying circumstances under which our English towns and villages are placed must necessarily demand as widely differing remedies or schemes for their efficient conservancy arrangements.

I break a lance for 'Goux,' because I believe I was the first medical officer in England to introduce the system to sanitary authorities. I still hold my old faith in its simplicity, efficiency, and economy. EDMUND J. SYSON,
Medical Officer of Health,
Huntingdon United Sanitary Districts.
Brighton, October 19, 1875.

HOUSES UNFIT FOR HABITATION.

(*To the Editor of the* SANITARY RECORD.)

SIR,—I am directed by our board to make a 'house to house' survey of the district of which I am inspector. In the course of my work I am requested by a lady occupying a new house to inspect the same, and on the 9th instant I did so; found the lower rooms very damp—in fact, the wet coming in under the wainscot over the floor, from the outside ground being left against the house nearly as high as the window sills—and not properly drained. The doors and windows did not fit, and the rain came in through the roof and skylights.

A few days previous to my visit the overflow from the soft-water cistern (which is under the kitchen) was choked, causing the water to burst up through the floor. When asked my opinion I stated that I considered the house unhealthy, and not habitable till the defects were remedied. The tenant complains that her landlord has not fulfilled his contract in making certain alterations in the house, and laying out the garden, etc.; consults her solicitor, who recommends her to leave the house at once; and, acting on his advice, she does so.

Can the landlord bring an action against the inspector for giving his opinion when in the execution of his duty (38 & 39 Vict. c. 55, sec. 92)—as he considers the case comes under the first clause of section 91 of the Act of 1875—or should the landlord sue the local authority? (See sec. 5, 264 & 265 of the above Act.)

I enclose copy of a letter received from landlord's solicitor. W. M. LOWICK.

Westbury-on-Trym, near Bristol,
October 17, 1875.

P.S.—The following is a copy of the letter which I have received from the landlord's solicitor.

October 16, 1875.

SIR,—Mr. M. has consulted me with respect to a statement made by you that certain property at W. belonging to him was not properly drained, not healthy, not inhabitable. In consequence of that statement Mr. M.'s tenant is leaving the house, and the report has rapidly spread in that neighbourhood that that and the adjoining property is not fit for occupation, and is generally condemned. I need not tell you the serious consequences which will ensue; and I am instructed to commence an action against you, unless you consent, on or before Tuesday next, to retract in writing this statement, and to cause the same to be published in such manner as my client shall think fit at your expense, and to pay all costs in connection with the matter. I am, Sir, etc., etc.,
X.

[This is much too serious a matter to be with propriety discussed in the 'Notes and Queries' column of a newspaper. We are, however, certainly of opinion that our correspondent has done no more than his duty, and that, under the circumstances, he is not liable to an action at the instance of the landlord concerned. Nor has the landlord, in our opinion, any remedy against the local authority.]

POWERS OF INSPECTORS.

(*To the Editor of the* SANITARY RECORD.)

SIR,—Will you kindly allow me space, in the next issue of your valuable paper, to express my opinion as to the power your correspondent 'T. T.' has to take proceedings in respect to dilapidated houses 'adjoining the public road.' I think he has ample power to deal with the nuisance complained of. By section 91, of the Public Health Act, 1875, the first paragraph defines a nuisance thus: 'any premises in such a state as to be a nuisance or injurious to health.' Notice under this section could be given to the owner of the houses, and proceedings taken, in case of non-compliance therewith, or what use is section 97, where justices have power to order the closing of houses which are proved to be, to their satisfaction, in such a state as to be unfit for human habitation?

I contend that where houses are next to tumbling to the ground through old age it is a nuisance injurious to health. Through such dilapidations colds may be caught, and, as the case must of necessity be, the sanitary arrangements of the houses are defective, fever in all probability would ensue. Besides the houses would be a nuisance through

the tenants being in constant fear and dread of the tenements falling down.

If your correspondent will be good enough to refer to your issue of April 3, he will see that I asked a similar question and that the answer was very different to his; and such a one as to satisfy me that I could take steps to close the cottage mentioned.

I take this opportunity of thanking you for the insertion and answer to my last communication. HOMO.

DANGER BEFORE BURIAL.

(*To the Editor of the* SANITARY RECORD.)

SIR,—I notice in your article at page 115 on 'Small-pox at Haslingden,' that it is believed that the disease had been spread by persons who attended the wake of a child who had died from small-pox, though an attempt had been made to prevent a wake over the corpse being held. It is, apparently, not generally known that a body may be so inclosed in a coffin that no such danger need be apprehended, and that the cost of guarding against such danger is very small.

Some years ago I was instructed to report to the Secretary of State upon a contrivance by Mr. K. Ogden, an undertaker of Manchester, which consisted simply of a coffin closed air-tight by putty or pitch, while, to avoid the confined air forcing its way through any minute aperture, its free escape was provided for through cells filled with crushed charcoal. It was, in short, an adaptation of Dr. Stenhouse's air-filter to a coffin.

Dr. Stenhouse and I put this contrivance to a very severe test by enclosing offal in such a coffin and after allowing time for putrefaction to become active, we drew air from the coffin by an aspirator in considerable quantity through a little water. The water became charged with carbonic acid, proving the activity of putrefaction, but no sensible putrescence was perceived in the water, or shown by its action on permanganate, except in a very minute quantity, the charcoal having intercepted it, and caused its decomposition, although the air was drawn through the charcoal by the aspirator so very much faster than it could have escaped unaided. I think it cannot be doubted that if the air had contained any zymotic germs they also would have been intercepted, though the proof of that is not so clear; it is at least certain that danger would be diminished to a very great degree, so much so as to be practically removed, just as it is by very wide diffusion in the open air.

Mr. Ogden told me that the extra cost of adapting an air-filter to a coffin is so small that no extra charge for it need be made; he hoped for sufficient remuneration by the expected increase of his business. I do not know whether this hope has been realised or not.

I believe all the real and nearly all of the imaginary danger from hospitals for infectious diseases might be avoided by an ample provision of air-filters, which would have the further advantage of allowing as much air to pass as is desired, while excluding dust and flies, also to a great degree deadening noise and checking disagreeable draughts. The cost of adding air-filters when constructing a hospital would be insignificant, while the advantage of using them would be great, especially in places where the external air is not perfectly pure, or where any apprehension from the presence or the hospital is felt. In such a case the charcoal used need not be removed, or if ever, not for a very long time, as impurity intercepted by it will be constantly decomposed by being brought into contact with the oxygen which charcoal absorbs, sometimes with such rapidity as to cause it to ignite, though only when it is freshly burnt.

If ambulances for conveying patients to a hospital for infectious cases were provided with an air filter at each end, the comfort of the occupant would be increased by the large supply of air passing through it without sensible draught, and by the complete exclusion of dust and flies, while danger from the passage of patients through the streets could not occur, and would scarcely be imagined.

It is strange that so very useful and so costless a contrivance should not be in more general use, as possibly it would be if some patentee had an interest in pressing its introduction; but Dr. Stenhouse generously gave his invention to the public, considering, probably, that a means of preserving health ought not to be monopolised for individual profit, any more than a means of cure should be; a generous sentiment on which members of our noble profession act, and will, I trust, long continue to act. It must, however, be allowed that it is not always easy to draw the line, dividing exactly what are from what are not proper subjects for patents, and no one could have justly blamed Dr. Stenhouse had he chosen to patent his very useful contrivance, though he generously abstained from doing so. P. H. HOLLAND.

ALDGATE PUMP.

(*To the Editor of the* SANITARY RECORD.)

SIR,—In reference to Dr. Saunders' report, published in the *Times* of Wednesday, and which appears to contradict my analysis of the water yielded by Aldgate pump, I beg to state that Dr. Saunders' result is in agreement with my own, and that the apparent disagreement arises from a misprint, and from the suppression of the analyses.

Oct. 21, 1875. J. ALFRED WANKLYN.

Review.

Sanitary Neglects as exemplified in the Houses of the Upper and Middle Classes. By W. EASSIE, C.E., London.

THIS paper treated first of all upon the difficulties which lay in the choice of sites for dwellings, the dangers of some gravelly sites, and mentioned that even with stony surroundings that care should be exercised, since the author had lately found sewage in a well which had travelled some 300 yards by way of the fissures in the rocks. Rising dampness and drifting wet were cured by damp-proof courses and hollow walls, and he denounced the covering of walls outside with paint, or the inside with washable papers, as such treatment simply destroys the breathing pores of the wall, by the means of which vapour is passed to the outside.

He also instanced the evils of erecting houses in the valleys of tidal rivers subject to floods and stagnant waters, stating that where lake water was regularly in motion, and the house built some twenty feet above, the malarial factors were rare.

The author then pointed out some of the dangers of drainage, the necessity of searching for the old cesspools which existed before water-closets, and the old brick drains which obtained before the new pipes, being, as they were, the source of nearly all domestic poisoning. Even the new pipes can be badly laid, and some of these imperfections and their results were explained.

The ventilation of the soil-pipes was the most important part of the house drainage, and also the proper disconnection of the butlers', housemaids' and kitchen-sinks from the drain; neither should the bath or lavatory wastes go direct into the drain. He had seen soil-pipes ventilated into rain-water pipes, and rarely found them properly ventilated.

Where houses must ventilate into cesspools, these should be cut off from the drain by an open chamber, and both ventilated, but this treatment would not dispense with the ventilation of the soil-pipe and open delivery of the sink and other wastes. The dust-bin, or what he called the dry cesspool nuisance, also wanted reform, if not a separate collection of the house-sweepings and ashes from the kitchen refuse, thus saving the parish the labour of sifting at the dust wharfs.

Water was also entered upon, and the dangers of the intermittent system explained, as were also the impropriety of allowing the overflows to run direct into the drains. Separate cisterns should be provided for drinking purposes, and the same cistern placed in the attics, otherwise the nursery would suffer, and the bed-room drinking water as well. No common filtering would render gas-impregnated water pure. Well-water ought to be analysed, and it was not wise to say that because no evil surroundings were seen about the well to-day, that the mischief had not been completed many years before. The author instances a case or two of this kind which had occurred in his practice. The supply-pipes were also of lead attached to leaden cisterns. Nor were the hot-water cisterns free from blame, for independent of their danger, they were objectionable. The strangest cases of water fouling might be looked for. He had seen the water in the hot-water supply cistern filled with dead black beetles.

With reference to the gas-supply, he made bold to say that if the 7,000 and odd houses which were added to London last year were tested, not a dozen would be found free from escapes. We did not know how to test them, and any one could be a gas-fitter with us; the only way to test that service was by a mercury gauge connected with a force-pump, nor resting satisfied until the gauge ceased to fall. He had only last week discovered five leaks in a partition that could not have been discovered in any other way. In England not one gas-fitter out of a hundred had ever heard of any such scientific testing.

SLAUGHTER-HOUSE NUISANCES.

SEVERAL butchers of Skipton have been summoned for not complying with the by-laws of the Skipton Local Board of Health in reference to clearing away nuisances. Mr. J. Heelis, clerk to the board, prosecuted, and Mr. W. A. Robinson appeared for the defendants. Mr. Robinson and Mr. Heelis having had a rather long legal argument as to whether the Acts under which the summonses had been taken out were repealed or not, the chairman admitted the legality of the summonses, and asked if the defendants admitted the offence. Mr. Robinson said they admitted nothing, not even the by-laws; but after some further argument he decided to waive his objection until the case had been gone into, of course reserving all rights until the end. Mr. Heelis then read the following by-law, No. 3:—'All the tubs, boxes, and vessels, which are used for the removal of any manure, garbage, offal and filth, and all the tubs, boxes, and vessels which are used for the removal of blood from any slaughter-house, shall, immediately after being used for such removal, be thoroughly emptied, cleansed, and purified; and the floor of such slaughter-house shall then be also effectually scoured and cleansed; and the whole shall generally be kept in such a condition that neither within the slaughter-house nor without it shall there be any offensive smell arising therefrom.' The nuisance inspector said the defendants had been warned again and again in reference to this question. There were no covered vessels provided for removal, the nuisance, which consisted of blood and slaughter-house refuse, being taken out in an open cart. They did not take it away once in twenty-hours, and it was a decided nuisance, having been complained about by many of the inhabitants. Mr. Robinson stated that the inspector had told the defendants to get a covered cart to take it away. Some six weeks ago his clients ordered the cart to be made of the best possible construction and with iron doors. He was sure that it would be finished this week. Mr. Robinson said his clients did not wish to be in collision with the local board, only they wanted a little time to get the cart. The cases were dismissed without a conviction on payment of costs—one defendant insisting that he had no right to pay these, or be summoned, as he was not a registered owner.

PUBLIC HEALTH EXAMINATION.

(Held at Cambridge University on October 5 and 6. Oral and Practical Examinations.—The Practical being Chemical and Microscopical Analyses of Water and Air.—Different Examples for every Candidate.)

PART I.

October 5, 1875. 9 A.M. *to* 12 M.

1. STATE how air is affected by changes of temperature. In what way do such changes give rise to aërial currents, and how may they be utilised for the purpose of ventilation? Mention the objections usually brought against what is called 'natural ventilation.'

2. Compare the properties of oxygen and ozone. How would you estimate the daily variations in the quantity of ozone present in the atmosphere?

A cubic foot of dry air at normal pressure weighs at 32° Fahr. 566·85 grains, and at 80° Fahr. 516·38 grains; what is the amount by weight of oxygen in each case? Will respiration and the other functions of the body be in any way influenced by such atmospheric changes; and if so in what way?

In the ascent of a height which lowers the barometer from thirty to twenty-five inches, what would be the diminution of oxygen in a cubic foot of air, other conditions remaining the same?

3. What is the difference between a common and an artesian well? What dissolved substances are most commonly found in river and well-waters respectively? What are the most common ways in which substances foreign to the normal composition of such waters find their way into rivers or wells? When sewage-matter is poured into running streams, what becomes of it?

4. What are the advantages and disadvantages of rain-water as a source of water-supply? How should it be stored? What is its action on leaden pipes?

Describe the construction of a common rain-gauge.

5. What do engineers mean by a head of water? What is the weight of a gallon and of a cubic foot of water? What quantity of water is contained in a cistern fourteen feet five inches long and nine feet three inches broad if the water stand at the height of thirteen feet six inches? What is the total pressure of the water on the bottom of the cistern?

6. Give a general account of the variations of mean annual temperature at different parts of the earth's surface. How are isothermal lines obtained? How is the temperature of any place affected by forests, expanse of water, height of the place above the sea-level, and by the existence and configuration of neighbouring mountains? What are meant by diurnal and annual changes of temperature, and what by continental and insular climates?

October 6, 1875. 9 A.M. *to* 12 M.

1. What is the composition of ammonia? Describe the best methods for its quantitative determination. Why is its determination in water and air considered to be of importance in hygienic analyses?

2. How would you determine the composition of the air in dwelling- and sleeping-rooms in respect to the presence of (1) carbonic acid, (2) watery vapour, (3) organic matters?

3. What are the arguments for and against the so-called 'constant supply' of water to houses? State particularly the possible dangers of an ill-arranged supply of this kind, and mention how these are to be avoided.

4. What are the chief precautions to be observed in the construction of pipe and brick-made sewers? What fall is given usually in each case? What are the best arrangements for flushing and ventilation? How would you ensure that there should be no reflux of air from the sewers into houses?

5. In modern houses which are plentifully provided with water-pipes and cisterns, and also with foul water and soil pipes communicating with underground drains, what precautions are necessary:—

(1) To preserve the purity of the drinking water?

(2) To keep the air in the foul water and soil pipes as free as possible from impurity, and to prevent it from getting into the house?

6. Why is it supposed that pavilion, or separate block, buildings are better adapted for a large hospital than a great single building?

In the construction of an hospital ward what are the generally received opinions as to the best materials for floor, walls and ceiling: the best position for closets; and the best arrangements for warming and ventilation?

Mention particularly any ordinary circumstances which are likely to make wards unhealthy.

PART II.

October 7, 1875. 9 A.M. *to* 12 M.

1. What are the regulations in the Public Health Act, 1875, regarding the occupation of underground rooms (or cellars) as dwellings? What is the definition of a dwelling? Against whom would you take proceedings in case of offence against the statute?

2. Enumerate the various matters defined as nuisances in the Public Health Act, 1875. State shortly the course prescribed by the Act for their abatement.

3. What powers are given to the sanitary authority for securing a supply of pure drinking water? In what cases can the owner be compelled to supply a house with pure water? What statutory provisions are made against the continuance of an impure supply?

4. What are the regulations in the Public Health Act respecting common lodging-houses? Define 'overcrowding.' What are supposed to be the consequences to health of 'overcrowding'?

5. What is the machinery of vaccination at present in force in the

United Kingdom? In the case of a severe outbreak of small-pox in a town, what measures would you adopt in addition to vaccination?

6. In the case of an outbreak of cholera spreading over Europe, what measures would you recommend to the authorities of a sea-port town in communication with infected districts? If cases of cholera appeared in the town, what measures would you adopt:

October 8, 1875. 9 A.M. *to* 12 M.

1. State the mode of calculating the death-rate of any town or district.

What is the advantage of comparing the birth-rate with the death-rate?

Discuss the question of age as influencing death-rates.

2. What are the chief causes of mortality among children under five years of age? How might these causes, or some of them, be removed?

3. What are the so-called 'zymotic' diseases of which the contagia or exciting causes are supposed to be carried by articles of food or drink?

Enter fully into the causation and mode of propagation of enteric (typhoid) fever; and state particularly how you would proceed in investigating a local outbreak of the disease.

4. What are the symptoms of trichinosis?

How would you examine the flesh in order to detect the entozoon? What other structures in the flesh of the pig may simulate the encysted trichina?

5. What is the evidence for the connection of lung-diseases with the inhalation of foreign particles?

6. In the disposal of water-sewage, what are meant by the terms 'precipitation,' 'intermittent filtration,' and 'irrigation'?

How far have the difficulties of disposing of sewer-water been met by any of these plans?

October 7 and 8, 1875. 1'30 P.M. *to* 5 P.M.

Visit———— Court, and make such observations and notes as may be required for drawing up a sanitary report.

Return to the Senate-House before 4 P.M., and draw up the report.

(In respect to the state of the houses your examination need not be extended to more than two of them.)

Every candidate had a different court or other place to report upon.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

BARNACLE, Mr. James has been appointed Inspector of Nuisances for the Spittlegate Urban Sanitary District.

DYKE, Thomas Jones, F.R.C.S. Eng., has been appointed Medical Officer of Health for the Merthyr-Tydfil Urban Sanitary District for six months.

FIRTH, Mr. John, has been re-appointed Inspector of Nuisances for the North Bierley Urban Sanitary District: 30*l.* for one year.

KING, Thomas, M.D. Univ. St. And., M.R.C.S. Eng., L.S.A. Lond., has been appointed Certifying Factory Surgeon for Rochford.

TAYLOR, Frederick Eyres, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Wells, Norfolk, Urban and Port Sanitary Districts.

WILSON, James Mitchell, M.B.C.M. Univ. Glasg., has been appointed Medical Officer of Health for the Rochdale Urban Sanitary District: 300*l.* per annum., with all office requirements.

WOODCOCK, Mr. Thomas, junr., has been appointed Clerk to the Haslingden Urban Sanitary Authority: 100*l.* per annum.

VACANCIES.

ACCRINGTON URBAN SANITARY DISTRICT. Medical Officer of Health: 100*l.* per annum for two years. Application, 30th instant, to Edmund Whittaker, Clerk to the Authority.

BALSALL HEATH URBAN SANITARY DISTRICT. Surveyor and Inspector of Nuisances: 250*l.* per annum, house, etc. Application, 30th instant, to W. J. Burman, Clerk to the Authority, 19, Cannon Street, Birmingham.

BURTON-ON-TRENT URBAN SANITARY DISTRICT. Medical Officer of Health.

CHATTERIS URBAN SANITARY DISTRICT. Medical Officer of Health.

DENBIGH URBAN SANITARY DISTRICT. Inspector of Nuisances.

FLEETWOOD URBAN SANITARY DISTRICT. Surveyor: Application, 29th instant, to William Ascroft, Clerk to the Authority.

HASLINGDEN URBAN SANITARY DISTRICT. Inspector of Nuisances and Collector. Surveyor. Application, 27th instant, to Thomas Woodcock, junr., Clerk to the Authority.

NEWINGTON, YORKSHIRE, URBAN SANITARY DISTRICT. Surveyor, Inspector of Nuisances and Collector: 125*l.* per annum to commence with. Application, 10th November, to C. J. Todd, Clerk to the Authority, Bowlalley Lane, Hull.

NORTH WITCHFORD RURAL SANITARY DISTRICT. Medical Officer of Health.

RAMSBOTTOM URBAN SANITARY DISTRICT. Clerk and Surveyor.

RAMSGATE URBAN SANITARY DISTRICT. Surveyor and Inspector of Nuisances.

SEVENOAKS URBAN SANITARY DISTRICT. Surveyor; 150*l.* per annum. Application, 31st instant, to G. F. Carnell, Clerk to the Authority.

SANITARY PATENTS.

3120. A new or improved mode or means for the preservation of alimentary substances. Edward Griffith Brewer, Chancery Lane, London.—A communication from Albert Emmanuel Aubert, Paris.

3162. Improvements in treating sewage and other impure or polluted waters. Alexander Melville Clark, Chancery Lane, London.—A communication from Paul Albert Bonard, Paris.

3174. Improvements in heating apparatus. Benjamin Looker, Kingston-on-Thames.

2875. Heating and regulating the heat of air, etc. Henry Boyle, Albert Square, Clapham Road, London.

2972. Earth closets. Robert Duncan, Billericay, Essex.

2959. Purifying gas. Peter Spence, Newton Heath, Manchester.

566. Filters and percolators. W. B. Gething, Fleet Street, London

2825. Improvements in ice production and ice-houses and store-rooms. Edward Thomas Hughes, Chancery Lane, London.—A communication from Gottlob Currle, Ulm, Wurtemburg, and Phülipp Holzmann, Frankfort-on-the-Maine.

3047. Improvements in the construction of ash pans for domestic fire-places. Charles Ezard, Bradford, Lancashire.

3073. Improvements in preserving fresh meat, game, fowl, fish, vegetables, butter, and similar articles. John Henry Ermatinger, Dunster House, Mincing Lane, London.—A communication from Dr. Fred. Sacc, Neuchatel, Switzerland.

3081. An improved process for preserving bread for the use of travellers, the army and navy, and others. Dominique Tamet, St. Mary Axe, London.—A communication from A. Mouries, Lyons, France.

ABSTRACTS OF SPECIFICATIONS.

The inventor forms the body of the filter or percolator in the form of an inverted cone, into the bottom of which the inventor inserts or places a piece of perforated metal or other material to act as a strainer to the said filter or percolator. The inventor places a metal cover, with screw cap inserted, and at the bottom of the said filter the inventor puts a funnel, so that it can be put into a bottle or other narrow mouthed vessel; the said filter or percolator may be made of tinned iron or other metal, and japanned or otherwise ornamented to protect it from damage or corrosion. The advantages the inventor claims are that it (the filter) will always keep the liquor free from dust or dirt or evaporation while in process of filtration.

573. Treating and clarifying sewage. S. Allsworth, Armley, and R. Bayles, Woodhouse Carr.

First mixture. Copperas, dry copperas, copperas bottoms, copperas sediment, the sediment that subsides from manufacture of nitrate of iron, the spent residue of iron pyrites, also spent pyrites. Second mixture. Spent residue of iron pyrites, iron ore or slag saturated with liquor from beds of iron pyrites at copperas works, or with diluted sulphuric or muriatic, or diluted nitric acid. The sewage or other matters is run into tank, to which is added slackened lime or gas lime, clarifying mixture no. 1, or mixture no. 2; the whole is agitated, allowed to settle, and the pure water run off.

590. Cooking and boiling by gas. J. C. Peacock, Queen Square, Bloomsbury, and T. Rudkin, Meat Market, Smithfield.

This provisional specification describes improvements in the oven described in the specification of the patent no. 1,065, 1874. Improvements in gas gridirons are also described, also in apparatus for boiling, either to obtain hot water or steam for cooking. Other improvements in cooking apparatus are also described.

597. Face-shields for respiring in noxious atmospheres. J. Sinclair Manchester.

The features of novelty in this invention which refers to that class of face piece to which a filtering apparatus is applied filled with layers of cotton, wool, charcoal, quicklime, or other absorbents of carbonic acid, cohsists in dispensing with the usual metallic mouthpiece and tubular water pads and in attaching the mouthpiece to a face piece formed of vulcanised sheet india-rubber, so shaped and sufficiently elastic to adapt itself to the face of the wearer, and in the upper part of which elastic face piece glass eye-pieces or goggles are mounted.

602. Preventing the pollution of rivers. W. B. Williamson, Bradford.

This invention has for its object the construction of a united system of drainage or sewerage, which consists of one main drain or culvert formed, by preference, of brick and mortar made water-tight, and taking the most suitable course to the sea-coast, and extending to some suitable distance over the sea at some feet of elevation above high water, which may be done by forming a pier. In connection with such drain or culvert the inventor constructs ventilating shafts to carry off the noxious vapours into the higher atmosphere. Near the several towns to be drained he constructs branch drains, and connects them with the main drain or culvert.

622. Gas for illuminating or heating purposes. R. Spier, Greenock, and J. Mather, Gateshead-on-Tyne.

The features of novelty which constitute this invention are the means and processes employed for producing gas for the purposes set forth.

628. Economising fuel and generating heat. T. R. Buchanan, Oxford.—A communication from H. A. Studwell, Brooklyn.

This provisional specification describes a deflector, consisting of a strip of sheet metal twisted spirally somewhat like an augur of the proper diameter, to be slipped loosely into a cylindrical boiler flue and serve to divide the same into two spiral passages, so that the flame or heated gases will act equally upon the entire inner surface of the flue.

OPEN CONTRACTS FOR SANITARY WORK.

THE Vestry of St. Leonards, Shoreditch, require tenders for the erection of a steam laundry and receiving wards. Specifications of quantities and details from J. Wallace Peggs, C.E., 4, Queen Ann's Gate. 5*l.* 5*s.* Tenders by November 3.

The Exmouth Authority require tenders for the removal of a portion of the gun-point sewer, and the rebuilding in concrete blocks. Details from Mr. H. C. Adams, clerk. November 3.

Huyton-cum-Roby, Lancashire, December 1. For plans, sections, and estimates for drainage works and disposal of sewage. Premiums of 100*l.*, 50*l.*, and 25*l.*, will be given for the three best designs. Mr. J. Jowett, 35, Moorfields, Liverpool.

The Rural Sanitary Authority for the district of Chard are prepared to receive tenders for the supply of materials and the execution of works in connection with the drainage of Crewkerne. Drawings and specifications, with quantities, from Mr. J. B. Ireland, Clerk, or Mr. G. W. Stevenson, engineer, 4, Westminster Chambers. Tenders must be delivered to Mr. Ireland not later than October 29.

Thetford Waterworks. The Town Council of Thetford desire tenders:—

For the sinking and boring of an artesian well.

For the construction and erection of a brick reservoir, manager's cottage, and other buildings.

For the providing and laying of cast-iron water mains, connections, hydrants, bends, valves, etc.

Drawings and specifications can be obtained at the offices of Messrs. Jabez Church and Son, 17B, Great George Street, Westminster, and at the Clerk's office.

Tenders to John Houchen, town clerk, before November 1.

The Local Board for Clayton, near Bradford, are prepared to receive tenders for the construction and making water-tight of a reservoir to hold about 3,000,000 gallons, together with a valve pit, meter-house, boundary walls, etc., situate at Little Moor, Clayton Heights, in the township of Clayton.

Plans and specification may be seen, and forms of tender had, at the offices of Mr. James Lumley civil engineer, 14, Kirkgate, Bradford, to November 6, from 10 A.M. to 4 P.M.

Tenders to Benjamin Ashton, clerk to the board, not later than November 9.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer —not necessarily for publication.

ABSORPTION OF WATER BY FRUIT TREES.

ADVICE is given by a German professor to keep in orchards a certain space around the trees free of grass and weeds, as these draw too much water away from the trees; indeed, it has been proved that trees which were sickly and bore little fruit, have been restored to vigorous growth by returning to them the necessary water in this way. To prove how much water fruit-trees need, it may be stated here that an acre planted with them will evaporate in about twelve days 5,000,000 pounds of water.

THE ACTION OF NICOTINE.

SMOKERS will doubtless find some comfort in a paper recently published by Dr. Benham. He administered nicotine to man and the lower animals, and found that it killed the latter, not by paralysing the heart, but by stopping the respiration. Indeed, he says, it quickens and strengthens the heart's action, and recommends its use for that purpose. He found that nicotine contracted the pupils, but its other effects on man were most variable. This seems indirectly to confirm Dr. Krause's opinion, and that it is carbonic oxide, and not nicotine, to which the evil effects of smoking are mainly due.

A CHEAP WINDOW VENTILATOR.

(*To the Editor of the* SANITARY RECORD.)

SIR,—MANY houses unfortunately are built without any provision for ventilation. Such houses may be ventilated by simply opening the windows, but this usually produces cold draughts which not only render the room uncomfortable, but endanger the health of the occupants. Some one has recommended to place a strip of board three inches wide and as long as the lower window bar, under the lower sash, thus leaving an opening between the top of the lower sash and the bottom of the upper sash, through which fresh air may enter.

I propose a modification of this plan, by which the air will enter in two thin layers, with an upward movement by which it will mingle with the warm air of the room so as to prevent sensible currents of cold air. Take two pieces of board a quarter of an inch thick, one inch wide, and as long as the lower bar of the window; three narrow pieces half an inch thick and one and a half inches long, one end being cut with the bevel of the window-stool. Nail these pieces across one of the long slats, one at each end and one in the middle, placing the short side of each piece even with the lower edge of the slat. Nail the other slat on the opposite side of these short pieces, bringing the upper edge of the slat even with the square end of the short pieces. This will make a compound bar with half an inch between the slats, and one slat half an inch higher than the other when the whole is turned upon its edge.

Place the whole under the lower window sash, with the higher slat on the outside. The air can then pass under the outer slat, between the two slats, and enter the room over the top of the inside slat, having an upward motion which will cause it to mingle rapidly with the warm air of the room, and thus prevent any sensible draught. By thus raising the lower sash, a space will be left between the top of the lower sash and the bottom of the upper sash through which another thin layer of air may enter the room at some distance from the layer at the bottom of the window. This air must also enter with an upward current, causing it to speedily mix with the hot air in the upper portion of the room.

This arrangement is especially adapted to secure safe window ventilation in bed-rooms. If properly constructed and inserted, it will never cause sensible currents in the body of a room except when strong winds prevail, when we usually secure enough ventilation by the imperfect construction of our window-casings, etc.

It is respectfully dedicated to those who love pure air.

Lansing, 1875. R. C. KEDSIE, M.D.

[The above description appears to be another variation of Mr. P. Hincke Bird's method of costless ventilation.—ED.]

CONSTANT WATER-SUPPLY.

(*To the Editor of the* SANITARY RECORD.)

THE inconvenience and danger of intermittent water-supply has been well established not merely for ten years, as seems to be implied in your article of the 21st, but for three or four times as long at least. I have been aware of the advantages of constant service ever since I first saw the Nottingham Waterworks in 1832. Those advantages were conclusively proved in Mr. Chadwick's report on the 'Sanitary Condition of the Labouring Population' above thirty years ago; was fully confirmed by the inquiries of the Health of Towns Commissioners; and is illustrated by the more recent experience you have referred to at p. 130.

The only excuse for not adopting constant water-service universally is the expensiveness of the fittings alleged to be necessary to prevent excessive waste of water; and it is evident that if taps or pipes constantly full are allowed to dribble, or are carelessly left open, there must be very great waste; but existing fittings may at small cost be so altered as to confine waste within very narrow limits, while new fittings that will do so need not be nearly so costly as those in common use. All that is needed, with existing fittings, is to substitute the small water-receptacles I described at p. 139 for the larger cisterns, now required to hold a whole day's supply, the fixing of the tap to the supply-pipe, having a small hole drilled through it to limit the quantity of water supplied to a small excess above what will be wanted, for what is both used and wasted cannot exceed what is supplied, and if it be carelessly wasted, the consumer himself will feel the inconvenience and take care to avoid its repetition; whereas none care to avoid waste if they feel from it no direct inconvenience themselves, however injurious it may be to the community generally. New fittings for constant supply, such as will confine waste of water within very narrow limits, will cost much less than ordinary fittings, because supply-pipes large enough to fill the little receptacles for water needed will cost very much less and be much more easily protected, and concealed than the large pipes now in common use. It is stated in the papers that the King's Mews, near Charing Cross, used to be supplied with water through a pipe the size of a goose-quill, and such a pipe, with very moderate pressure, would in the course of a day convey water enough to supply many houses, while the cost for procuring and laying such piping would be very moderate indeed. I have no desire that the quantity of water brought into towns should be diminished, for there are few in which more than is now obtained could not be usefully employed; but I do wish that as little should be wasted as possible in order that more might be used. For example, it is very desirable that the surface of every street should be thoroughly well washed every morning, so that they may be as sweet and clean every day as they are occasionally after a heavy rain. If such washing be done properly, though all offensive dirt would be removed, very little useful material would be washed off, and most of that might be saved for road repair in catchpits to detain the grit while allowing the injurious dirt to be carried away. It would also be very desirable to have water enough to supply swimmers with free swimming baths, at which our youths might learn to swim; we should not have to record ten or a dozen deaths by drowning in a week.

If we avoided waste of water we might afford enough for really ornamental fountains, such as would look more like fountains and less like squirts, than those in Trafalgar Square are said to do. We need not, then begrudge an ample provision of drinking-fountains and water-troughs, so that neither man nor beast need suffer from thirst, and we should not be pained by seeing sheep driven through the streets, with their tongues covered with glutinous slime, running to every dirty puddle, and finding mud only, or oxen half mad with thirst, a torture to themselves and a danger to us. If drinking-troughs were very numerous, each might be so small that only a few beasts could drink at once, so that inconvenient collections of many together would be avoided, the only fair objection to their existence.

H. H. P.

EARTH TO EARTH.—The superiority of the London Necropolis (Woking Cemetery) has been specially recognised in the *Times*, and other leading journals, and it is admitted that here only can the burial of the dead be properly carried out. The Company is prepared to conduct Funerals without the intervention of the ordinary undertaker at any stage of the proceedings. Prospectus free.—Office, 2 Lancaster Place, Strand, W.C.

NOTICE.

THE SANITARY RECORD *is published every Saturday morning, and may be ordered direct from the Publishers. Annual Subscription, 17s. 4d.; free by post, 19s. 6d.*

Original Papers.

THE PUBLIC HEALTH ACT, 1875.

A VERY useful summary of the provisions of this Act, and the alterations created by it in sanitary law, has been issued to urban sanitary authorities by the Local Government Board.

The Act, so far as sanitary law proper is concerned, consolidates the whole of what were called the Sanitary Acts, with the exception of the Bakehouses, Baths and Wash-houses, Artisans and Labourers' Dwellings, and Labouring Classes Lodging-House Acts. All the other Acts are repealed. By the New Act all sanitary authorities are recognised as local authorities, and their duties and powers, where altered or amended, are pointed out under various heads. As to sewage and drainage, the Act makes it clear that all sewers, whether in or out of the district, are vested in the local authority, and render more stringent the provisions as to the pollution of water by sewage works, and requires all sewers to be ventilated, gives power to construct new sewers where old ones are ineffective, or where their course ought to be changed, and to apportion the expense to any owners of houses, who can be compelled to use the new sewers; and there is an extension of power for leasing land used for purposes of sewage distribution from seven to twenty-one years. Great alteration has been made in the subject of water-supply, and this appears to us to be one of the most valuable portions of the Act, removing the absurd anomalies which have existed up to the present time in this most important part of the duties of a sanitary authority. In common with other portions of the Act it draws more closely the bonds which unite the local authority to the central board, and makes their consent essential to the purchase of water rights. These, so far as competition is concerned, are now restricted to water companies having Parliamentary sanction for their works; those companies existing under deeds, or established under the Limited Liability Acts, being entirely ignored, except where it is a question of purchase; so that local authorities may now diminish the value of a water company's undertaking by threat of competition, and then with certain consents, gives them power to purchase the undertaking so deteriorated in value. The Waterworks Clauses Acts are now incorporated, and the difficulties before existing as to charging water-rents for water supplied are now removed. Another most important addition is the power given to local authorities to supply water to districts adjacent to their own. There is an extension of the protection of purity to the case of water used for the manufacture of aërated or other drinks; and proceedings can now be taken in cases of impure supply to houses against the owner as well as the occupier, and the local authority may execute any necessary works, and recover the expenses incurred in a summary manner. There is also further power as to precautions which may be taken by the local authority to prevent the spread of infectious diseases in common lodging-houses. As to nuisances, the decision of the Court of Queen's Bench in the case of *Rye Guardians* v. *Paine* (44 L.J., M.C., 148) rendered it unnecessary to alter the wording of the sections of the sanitary law providing against overcrowding by members of the same family. A penalty is now inflicted on persons creating a nuisance; and a very useful alteration is made in the law which now allows proceedings for the removal of nuisances, when arising in one district but showing itself in another, to be taken in the district where the nuisance has arisen, by the local authority of the district where the nuisance practically exists; further facilities are given for dealing with offensive trades, and these provisions are extended to the metropolis. With regard to the removal of persons suffering from infectious diseases to hospitals provided by the local authority, the power of determining whether the hospital is a suitable one is removed from the Local Government Board and lodged in a justice, and expenses incurred for maintenance may be recovered from patients who are not paupers. The obligation to provide a mortuary is no longer permissive; and any person obstructing the execution of an order to remove to any mortuary the body of a person who has died of infectious disease is liable to a penalty not exceeding 5*l*. All toll gates within the district of a local authority may, by agreement with the trustees of turnpike roads, be removed. Penalties are inflicted on persons injuring trees in public streets. In addition to plans and sections, the local authority must deposit estimates of the cost of sewering and paving private streets before compelling the execution of such works. Where now only the front of a house is taken down, the local authority may compel the setting back of the house to a prescribed line: and any one projecting a new building beyond the line of adjoining buildings may now, instead of being proceeded against by indictment, be summarily convicted, and fined 40*s*. per day during the continuance of the offence. Railway companies are exempted from the operation of by-laws as to new buildings, which now may include provisions as to the structure of chimneys and the regulation of public pleasure-grounds. All disapprovals or approvals of the plans of new buildings are to be signified in writing within one month after deposit. Supplying gas is, for the first time, made a sanitary purpose; all limitations as to contracts which formerly could only be entered into for three years are removed, and unless there be a gas company supplying gas by virtue of the provisions of an Act of Parliament within the district, the local authority can, with the consent of the Local Government Board, get a provisional order and supply gas not only to the public lamps but also to the private customer. They may also buy up any gas company within their district, whether with or without parliamentary powers, in the same way as they might purchase water companies and market companies, all being now assimilated in this respect. Some small changes are introduced as to police regulations. Contracts and by-laws will, in future be sufficiently attested by affixing the seal of the local authority without the signature of five members. Land may be re-sold when not required, but surplus land must, before being sold, be offered to the owner of adjacent lands, and notices as to rights of common will be sufficient if served on three of the owners. In case of failure to appoint an arbitrator, the appointment now rests with the Local Government Board instead of the Court of Quarter Sessions, and all awards are to be made within two months of the date of submission to arbitration or reference to an umpire. The Local Government Board have now the power to prescribe the qualifications and duties

of all medical officers of health, although no portion of their salaries is paid out of public moneys. Deputy and assistant medical officers may also be appointed by local authorities. It is no longer essential that the acts of all committees should be ratified by the urban authority appointing them, but no committee can borrow money, make a rate, or enter into a contract. All expenses in urban districts are to be paid out of general district rates, except where highway rates may be levied and the incidence of rating can only be altered by provisional order, obtained on the petition of the local authority or of ten ratepayers. District rates are continued and the basis of assessment for rating is, in future, to be only the valuation list of the Assessment Committee of the union. Highway districts are no longer to form part of urban districts and the Court of Quarter Sessions are to issue orders for the election of waywardens. Doubts said to exist as to the repayment of loans (we do not know how or where), are now supposed to be entirely removed by Clause 234 of the new Act, and the powers of borrowing conferred on local authorities are extended to port sanitary authorities, joint boards and other bodies constituted by the Act. Reference is made also in the circular to the Public Works Loans, and Local Loans Acts of last session. 'The first Act consolidates, with amendments, the law relating to loans by the Public Works Loan Commissioners, and section 13 requires that every intending borrower shall send to the Commissioners on or before December 31 in every year, a statement of the loans likely to be required during the ensuing financial year, commencing with April 1 following, and the Public Works Loan Commissioners are prohibited from granting any loan which has not been included in the statement above referred to, except with the consent of the Treasury, which can only be expected under very exceptional and pressing circumstances.' The first statement is to be sent in on or before December 31, 1875. The Local Government Board are to see that the loan is properly expended.

'The Local Loans Act enables local authorities to borrow sums which they are authorised to raise upon debenture stock or annuity certificates, and section 26 empowers them, when they propose to raise a loan by the issue of securities under the Act to apply to the Local Government Board to authorise the issue of such securities under official sanction, and this sanction will be conclusive evidence that the local authority had power to issue the securities, and that the same are in conformity with the Act.' It should also be stated that the Act enables local authorities to reborrow, in the manner prescribed by it, any sums required for the purpose of discharging existing loans, see section 31. This Act will not come into force until January 1, 1876, and in the mean time the Board will cause the necessary forms of instructions to be prepared for giving effect to the provisions referred to.' Where the district auditor is a member of the local authority the Local Government Board have the duty of appointing another auditor, and improvement commissioners, in conformity with recent decisions, must have their accounts audited in the same manner as local boards, and the auditor has now power to surcharge any sums lost by negligence or misconduct, on any accounting person by whose default the money has been lost.

There are various minor alterations of detail in legal proceedings and appeal. Much greater powers are conferred on the Local Government Board as to the alteration of areas, and the settlement of disputes as to boundaries.

Still more important is the provision in Clause 286, recognising the principle for which this journal has always contended, viz., the desirability of uniting several districts under the control of one medical officer of health, both on the score of expense and other advantages; and the Local Government Board can now enforce the union of districts for this purpose, and 'prescribe all necessary consequential regulations.' If any of the districts object to this union, then and in such case a provisional order must be obtained. Further, in order to prevent conflict of authority, no other medical officer of health can be appointed in any part of such united district except as assistant to the medical officer of health; and the district poor-law medical officer may be required to give local assistance to the medical officer of health. Slightly extended power is given to the Local Government Board as to port authorities. Slight alterations are also made as to provisional orders and local acts. The right of entry of local authorities is extended from the hours of nine and four to ten and six. Town councils in all cases are to supersede local boards, improvement commissioners, etc., and the property, powers, and liabilities of any burial board in a district are also transferred to an urban sanitary authority when constituted in a district; and power is given to local authorities, when desirable, to change their names. Express provision is made to meet difficulties arising from quoting in other Acts sections of the repealed Acts. 'Thus, if by any Act of Parliament, the consent of owners and ratepayers to any matter—as for instance, in the case of the Municipal Corporations (Borough Funds) Act is required to be expressed by resolution, in the manner provided by the Local Government Act, 1858, the resolution in future must be passed in conformity with the requirements of Schedule 3 of the present Act.' All by-laws which have been made previously to the passing of the Act and which are repugnant to its provisions are by the Act repealed, and all others confirmed. Boards constituted for the purpose of main sewerage may be dissolved or otherwise dealt with by the Local Government Board. There are saving clauses to preserve the authorities and arrangements in existence at the time of the passing of the Act, and the last Clause to which attention is called is that 'which excepts mines and the manufacture of mineral produce from the operation of the Act.' Under the Nuisances Removal Acts, the exception extended not only to mines and the smelting of ores and minerals, but also to the manufacturing of the produce of such ores and minerals generally. The exception in Section 334 of the present Act is less extensive, and only applies to the mines and the smelting of ores and minerals, to the calcining, puddling, and rolling of metals, and to the conversion of pig iron into wrought iron, so as not to interfere with those processes. The schedules to the Act contain rules as to meetings and proceedings of local authorities, committees, and local boards, rules for elections of local boards, regulations as to wards, qualification of voters, scale of voting, and register of owners, counting of votes, retirement of members, casual vacancies, etc. Power is given to the Local Government Board also to settle any difficulties arising from the lapse of a local board, and to determine any question as to the fact of a local board having lapsed. The third schedule lays down rules as to resolutions of owners and ratepayers, and

enables adjournments of meetings to take place from time to time. The circular concludes by stating that it has not alluded to minor matters, but hopes the observations contained in it will be of service to urban authorities, and in this hope we most cordially concur.

ON THE RESULTS WHICH MAY BE EXPECTED FROM THE CARRYING OUT OF THE ARTISANS' DWELLINGS ACT, 1875.

BY HENRY JOHN YELD, M.D., F.C.S.,

Medical Officer of Health for the Borough of Sunderland, and President Elect of the Northern Counties Association of Medical Officers of Health.*

THE Act passed last session of Parliament for facilitating the improvement of the dwellings of the working-classes in large towns is one which has met with the general approval of the country, and the results which it is hoped will be produced upon the health of the people by carrying the Act out in its integrity, are looked forward to with peculiar interest by both sanitarians and philanthropists.

The medical officers of health, as a matter of course, look upon the Act from a sanitarian point of view, namely, in its bearing upon the health and mortality of communities, at the same time fully recognising its tendency to ameliorate in no small degree the social and moral condition of the lower classes.

The preamble of the bill states very clearly 'that, by reason of want of light, air, ventilation, overcrowding, or of proper conveniences, and from other causes, certain houses, courts, and alleys, in many cities and boroughs, are in such an unsanitary condition as to be unfit for human habitation, the results being that fever and diseases are constantly generated therein, causing death and loss of health, and not only in such houses, but also in other parts of such cities and boroughs.' That such is the condition of many parts of our large and even small towns is painfully true; but hitherto there has been no remedy for such a state of things except by a local authority obtaining a special Act of Parliament.

The remedy has now, however, at length been provided; and upon the medical officer of health has been very fairly laid the responsibility of recommending the application of the same in such a manner as shall be best calculated to prevent and arrest the progress of disease and death in our large and populous towns.

It is not my intention to make any observations respecting what may be termed the general machinery of the bill, inasmuch as all that devolves upon the medical officer of health is to make his official representation as to the unhealthiness of an area or district, and giving it as his opinion that the sanitary defects in such area cannot be effectually remedied otherwise than by an improvement scheme for the rearrangement and reconstruction of the streets and houses within such area, or of some of such streets or houses. Upon this representation being submitted to the local authority, it becomes the duty of such authority to act upon such representation.

Presuming that this Act will speedily be put in operation in most, if not in all, of our large towns, the question very naturally arises, What may be expected as the ultimate result of the carrying out of this Act of Parliament?

In answering this question, it will be necessary, in the first place, briefly to point out in what way the unsanitary conditions previously mentioned injuriously affect the public health, which may be stated as follows:—

1. They are the existing causes of, and the means of propagating, typhus and enteric fevers, and other forms of zymotic disease.

2. They are the predisposing causes of consumption and various other forms of scrofulous diseases.

3. They are in an especial manner inimical to infant life, causing atrophy, convulsions, and other infantile diseases.

4. They deteriorate and enfeeble the physical and mental vigour of persons compelled to live under such conditions, whereby such persons become more amenable to, and more readily succumb to, attacks of disease other than those of a preventable character.

5. They tend to demoralise the people, and are productive of vice and immorality in all its varied phases.

In speaking of the results likely to be achieved by any great undertaking, we very naturally draw our conclusions from considering the effects produced in other places where works of a similar character have been carried out. It may not be generally known that in the year 1867 the town council of Sunderland obtained a Town Improvement Bill, which in its objects was almost precisely similar to the Artisans' Dwellings Act.

The borough of Sunderland is composed of three townships, viz.: Sunderland-by-the-Sea, Bishopwearmouth, and Monkwearmouth, the last named being separated from the other portion of the town by the River Wear. The parish of Sunderland-by-the-Sea is the oldest portion of the borough, and, as is usual in old seaport towns, contains a dense population, principally of the lowest classes, the sanitary condition of this township prior to 1867 with regard to overcrowding, want of air, proper conveniences, etc., could scarcely be realised without making a personal inspection of the rookeries, alleys, and lanes, as a result of which state of things typhus fever was constantly endemic, and the general mortality of that district was excessively high.

In the five years, 1856 to 1860 inclusive, before drainage and water-closets were completed, the average annual mortality of Sunderland parish was 32·0 per 1,000. For five years after drainage was completed, namely, from 1861 to 1865 inclusive, the average annual mortality was reduced to 31·0 per 1,000, a clear indication that causes were at work other than deficient drainage in keeping up the mortality of the district.

In the year 1866 so severe was the epidemic of typhus fever that a special commission was appointed by the town council to inquire into the causes at work in producing this terrible disease, and in keeping up such a high death-rate.

The evidence given before that commission disclosed some appalling facts; in some of the lanes and alleys, which were not more than three or four

* Read at the quarterly meeting of the members of the Northern Counties Association of Medical Officers of Health, October 6.

yards in width, the population was at the rate of 800 persons to an acre, and in three of the lanes there were 805 persons to an acre, and the houses were ill-constructed, with scarcely any ventilation, and dark, dismal, and filthy, and being back to back houses no conveniences of any kind were attached to them.

Dr. Evans, the poor-law medical officer for the district, stated in his evidence that at that time he had 200 cases of fever on his visiting list, and it will give you some faint idea of the epidemic when I tell you that the cost to the ratepayers of the union in connection with the epidemic, from September, 1864, to March, 1866, the time when the inquiry was held, amounted to 2,114*l.* 7*s.* 7*d.*

The causes of the epidemic, as laid down by Dr. Evans, were:

(1) Over-crowding; (2) water-closets without water; (3) gully-holes in house-passages; (4) slaughter-houses with putrid offal; (5) poisonous gases; (6) defects in construction of dwellings; (7) middensteads.

The conclusion come to by the committee was that the state of the atmosphere was the primary cause, and that that had been assisted by want of ventilation in the tenemented houses of the poorer classes, over-crowding and filthy habits of the people, and the consequent emanation of poisonous gases.

It will doubtless have occurred to you that the causes numbered 1, 3, 5, 6, and 7, in Dr. Evans's report are just the very ones which would bring such an area as the one mentioned under the provisions of such an Act as the one now under consideration; fortunately, however, for Sunderland, the corporation did not wait for a general Act to be passed, but applied for and obtained a special Act dealing with this and other municipal matters.

The Sunderland Extension and Improvement Act came into operation on August 31, 1867, by which the corporation had power from time to time to borrow at interest such money as they might require for the purposes of the Act, not exceeding 100,000*l.*, such sum to be repaid within forty years from the said August 31; and it was further provided by the Act that the Corporation should within ten years of the passing of the Act expend in the execution of works in the parish of Sunderland a sum of not less than twenty thousand pounds. It is not necessary that I should go into further details respecting the provisions of the Act, as I do not wish to trespass too much upon your time.

The corporation set to work with a hearty good will to carry out the improvement scheme, which has now been very nearly completed; the old-fashioned streets and alleys mentioned have disappeared, and have given place to new streets of from thirty to thirty-five feet in width; 500 houses were pulled down, displacing about 10,000 persons. At the time this was going on, the building of cottages and tenemented houses in other parts of the borough was being carried out and up to December, 1873, accommodation had been provided for 10,846 persons.

The total amount spent by the Improvement Committee up to the present time is a little over eighty-eight thousand pounds.

As may naturally be supposed the work of demolition was very gradual, and, as in all enterprises, many difficulties were thrown in the way by owners of property, and courts of arbitration had to be appealed to from time to time, but it may be taken as a fair statement that most of the worst class of property had disappeared by the end of the year 1872, from which time we shall see that a marked improvement has taken place in the condition of the people of that parish. I do not say that all the unsanitary conditions have been removed, as some of them, and more especially overcrowding, are extremely difficult to deal with; at the same time it will be admitted that overcrowding in houses situated in good wide streets with free ventilation is not likely to produce such disastrous results as when the streets are narrow and houses badly ventilated.

As I have previously stated, the death-rate in Sunderland parish in 1865 was 31·0 per 1,000. In the years 1870-71-72 the average annual death-rate was 23·7 per 1,000 and the number of deaths from typhus in those years averaged thirty-four per annum.

In the year 1873 the death-rate of Sunderland parish was 25·7 per 1,000, and of the 464 deaths in that year three were from typhus, two of which occurred in the first quarter and one in the last quarter of the year, and five from typhoid fever.

In the year 1874 the death-rate was 26·6 per annum, being in consequence of an epidemic of scarlatina, somewhat in excess of that of 1873; and of the 479 deaths five were from typhus and three from typhoid fever.

In the present year, to September 30, no deaths have been registered as arising from typhus fever; neither has the medical officer for the district had any cases of typhus fever under treatment. Two deaths have been referred to typhoid fever, but the district generally has been remarkably free from diseases of the zymotic class.

The conclusions to which I have come after a careful consideration of the subject, as to the beneficial results likely to follow the carrying out of the Artisans' Dwellings Act, may be summarised as follows.

1. That zymotic diseases, and more especially typhus fever, will be almost, if not entirely stamped out in those districts or areas in which the Act is applied. It can scarcely be expected, however, when we consider the habits and conditions of the lowest strata of society, that there will not be an isolated case of typhus from time to time; but with the sanitary appliances of the Public Health Act of 1875 at command, this and other diseases of its class will be pretty completely under control.

2. That in consequence of the improved sanitary condition of an area, its rate of mortality from general as well as from zymotic forms of disease will be diminished.

3. That in consequence of the more healthy conditions under which the children are brought up, the infant mortality of an area will decrease.

4. That the general health of the people of the district will improve, such improvement manifesting itself in the increased longevity and the more healthy physical appearance of those who have been transferred from dark, dismal, and wretched dwellings, into others of a cheerful and healthy character.

And lastly. That the general social condition of the people will be greatly ameliorated, and that misery and wretchedness, uncleanliness, crime, and drunkenness, will gradually give place to happiness and cheerfulness, and to habits of cleanliness, honesty, and sobriety.

EXHIBITS AT THE SOCIAL SCIENCE CONGRESS, BRIGHTON.

As promised in our last, we give a short notice of the following exhibits.

MESSRS. JAS. STIFF AND SONS, of High Street, Lambeth, exhibited, amongst other goods, some new improved traps of earthenware, which attracted much attention. The new sewer-trap, as it is called, has been used at the New City Mission House, Blackfriars, and elsewhere, and has three receiving apertures of four inches diameter, one on each of three sides, so that from whichever side the drains approach they can be readily connected with the trap.

These connections can be made without the use of junctions, and if all of them are not required the unused aperture can be closed with a disc or plate, which can be again readily removed if a further collection of wastes be a desideratum.

The trap is formed by a deep diaphragm between the inlets and outlet, dipping considerably below the water-line, so that sewer-gas is not likely to pass. Should the pressure, however, be so strong as to break through this deep water-seal, the gas will immediately escape into the open air through the iron grating, which fits on the top of the trap. It is intended that these traps should be fixed at a convenient distance from the house, but in the event of its being found necessary to place them near or within the building the top can be closely covered down with a slab of stone, through which the ventilating-pipe should be conducted to the open air and so up to the roof top. Care should be exercised that the holes of the unused apertures are properly covered up with plates in cement, and we are afraid that these earthenware discs are not at all well known by our drainage hands. For the rest, the trap under review is a very convenient and efficient article.

MESSRS. STIFF also exhibited another sewer-trap of the inlet syphon order and of a simpler kind. It surpasses those commonly made in the great depth of the diaphragm below the water-line and the consequently decreased probability of the sewer-gas forcing its way through the deep water seal into the house-drains. When used at a distance from the house, and fitted with a perforated grating over the central aperture, it affords a complete security against the entrance of sewer-gas into the house, inasmuch as the gas will escape into the outer air through the apertures. A ventilating-pipe can be affixed over it also as in the case of the first-mentioned trap. When a mere ventilating cap is used, and not a ventilating pipe, the aperture acts as an access plate for inspection of the trap and removal of any possible stoppages. Both of these sewer traps are very useful articles in our opinion, and with the head of the drain at the house, such as for instance, the soil pipe, ventilated in order to clear the drain between the trap and the house, the latter may be considered perfectly safe. The same firm, by the way, exhibit some stoneware sinks for scullery and dairy uses, and these must strongly be commended as being clean and not subject to corrosion. Their new designs in filters are also very beautiful.

MESSRS. DOULTON AND CO., of Lambeth, also exhibit some very choice sanitary goods, which deserve far more than the mention which they can possibly receive from us. We may notice, however, their new patent joint for stoneware pipes. Every one knows that it is a very difficult thing to obtain two drain-pipes which have been turned out true from the kiln, and the spigot of the one pipe exactly fitting into the socket of the other. This patent (Stanford's) joint is obtained by casting upon the spigot and in the socket of each pipe, by means of prepared moulds, rings of some cheap and durable material, so that there will be mechanical fitting of the pipes together. The plan seems in every way feasible, and we recommend it to the attention of our readers.

The stoneware sinks exhibited by this firm were also of the most complete and well constructed patterns. They compare very favourably in point of expense with lead ones. We noticed also a very useful article in the shape of a nose-bag filter for use in tanks, etc. The filter is filled with gravel or other filtering material and is placed at the bottom of the well or tank, or rather below the bottom, and the suction of the pump is fixed into the pipe which comes up the centre of the filter. At the bottom of the pipe are small holes. The action of the pump draws water through the large holes in the base of the filter casing, then through the gravel, and afterwards through the small holes in the filter tube, and so on to the utensil. The cleansing power of this unique filter is described as great, and we see no reason to doubt it. It would be a great boon to places where a storage of filtered water is rendered, for some reason or another, impossible, or is tabooed on account of expense. When the filter requires cleansing, it is simply drawn up to the surface, emptied, recharged, and replaced.

Of the excellence of the Art ware of this firm it is needless to speak. We were more especially struck with the decorations in painted tiles intended for the spandrils over the tanks of the new Westminster Aquarium. The painted under-glazed ware, which is known by the name of 'Lambeth faïence,' is also admirably adapted, as might be seen, for wall-decorations, plaques, vases, etc.

The salt-glazed decorated stoneware which is technically called 'Doulton ware,' also received a great deal of attention from the co-exhibitors and visitors of the museum. It is astonishing to us how it is possible to produce so many different articles without undue repetition of shape and ornamentation, but we are assured that it is achieved, and that upwards of ten thousand articles have been turned out by the artists of these works, each boasting an individuality of its own.

In point of value as a sanitary invention, the patent trap and foul-air withdrawing cowl of Mr. BANNER of Brighton and London, were the gems of the exhibition. We say this advisedly, for if there are two contrivances more than any others in the way of sanitation that have puzzled our inventors, the house trap and the drain ventilator are those two. The trap invented by Mr. Banner has been several times referred to in our pages, and a description of it attempted, but without woodcuts it is quite impossible to do justice to it. We shall shortly be placed in a position to illustrate this trap with its last improvements, and also the cowl, for use upon the ventilating pipe in connection with the drain. Meanwhile we will venture to say that Mr. Banner's system of trapping is a sound one, inasmuch as one trap suffices for the whole house. And we know his method of ventilation is a good one, because he introduces a current of air into the foul-air pipe, and the cowl perpetually draws it out. He also showed by experiment that without an inlet of air into the ventilating pipe, no cowl will work as a foul-air extractor.

THE
SANITARY RECORD.
SATURDAY, OCTOBER 30, 1875.

TO SECRETARIES OF SANITARY ASSOCIATIONS AND KINDRED SOCIETIES.

The Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers read before the members of any sanitary or kindred association.

THE DIFFUSION OF SCARLET FEVER.

SCARLET fever is once more becoming epidemic in London. This is shown by the reports of the Asylums Board and the Registrar General.

From Dr. Whitmore's report on the health of the parish of St. Marylebone during August and September last, we find that scarlet fever is very prevalent in his parish, and caused twelve deaths in August and forty-three in September; the monthly average being eleven, we see that these were nearly four times the average number of deaths in September. Dr. Whitmore rightly speaks of this as 'an excess which it is to be lamented is not solely consequent upon causes beyond human control, but simply as the result of most inexcusable neglect, or excusable only when it arises—as it often does—from deplorable stupidity and ignorance;' and he suggests that the Government should be induced to make such further amendments in the Sanitary Acts as will render compulsory the isolation of those suffering from infectious diseases. The difficulty that would often arise in cases of separation of mothers from children might be met, in the case of the model lodging-houses, by having 'a large well-ventilated chamber, built as near the roof as possible, properly detached from the occupied rooms, and fitted up for infectious cases;' but this suggestion will not meet the difficulty for the great mass of the poor, although it might, as Dr. Whitmore says, be carried out in courts also. Anything which tends to secure isolation is a step in the right direction, and we cannot too strongly recommend the School Board visitors, as Dr. Corfield did in his introductory lecture at University College, to use their excellent opportunities for preventing children who live in infected houses from going to school, instead of compelling them to go, as at present they are doing. Another suggestion made in the same lecture was, that the law should make it compulsory on medical men to report all cases of infectious disease to the medical officer of health. We observed that at the Social Science Meeting at Brighton this suggestion was also made, and was objected to, on the ground that medical men ought not to be constituted public informers. This argument has no great force; we want to stop the spread of these diseases, and the first thing is to see that the medical officer of health gets all possible information of their whereabouts. As it is, medical men will not, as a rule, run the risk of offending their patients by reporting fever cases; but if it were compulsory on them to do so, no offence could be given; they would do it as a matter of course, and if a patient objected, the doctor would say, 'I have no choice; if I don't report this case to the medical officer, I run the risk of being prosecuted by the sanitary authority;' there can be no doubt that such a law would be a great advantage to the community at large, and would be no hardship whatever to the medical profession.

HEALTH TEACHING IN SCHOOLS.

MR. STANSFELD, a minister who has done some good things badly (among them the Public Health Act, 1870), and some bad things well, has done this week good service in advocating the teaching of the laws of health in Board Schools. Speaking at Croydon, he said:

'Among the subjects of instruction was domestic economy, and he was not certain what was meant by that phrase, unless that every child was to be taught the laws of health. In teaching the laws of health it was impossible to avoid teaching the laws of decency and morality. He was himself greatly responsible for the Public Health Act of 1870, and during the last session a measure calculated to have more important results — the Artisans' and Labourers' Dwellings Act—had been passed, but both those Acts together could not do as much for the health of this country as would be secured if the whole country were provided with schools through which the whole juvenile population should pass, and in which they should be taught the laws of health and the necessity of an obedience to those laws.'

Sir H. Cole, C.B., speaking at the Lancashire and Cheshire School of Science and Art, made a similar suggestion. He said: 'It appears to me that some of the subjects which I have mentioned are especially worthy of the attention of night classes in institutes. Take for instance health and all that promotes it: good air free from poisonous odours out of doors, ventilation in-doors, warmth, and only healthy warmth, in the house, cleanliness of the person, and of the habitation. If the laws of health and science were properly understood and studied by night classes in Manchester, it would not be long before Manchester, instead of losing 150,000*l.* a year in its sewage arrangements, would be putting 20,000*l.* a year into the pockets of the ratepayers and making its sewage as profitable as its gas-supply. Cookery is another subject I commend to the notice of the institutes, especially for women in the evening. It has been found to be a fascinating art. The first

work is to find a competent teacher and this at present is a difficulty, but it is being gradually overcome by the National Training School for Cookery at Kensington. The Society of Arts offers five free teacherships to be competed for among the Institutions in union, and I recommend the offer to your notice.' We heartily hope that these suggestions will be generally adopted by school boards.

METROPOLITAN DRINKING WATERS.

WE publish this week a further report on some of the most highly reputed pumps and well waters of the metropolis. These are mostly taken from the West-end of London. The first selected is St. Govor's Well, in Kensington Gardens, which enjoys a special reputation, not only for the purity of its water, but for its supposed healing powers. It scarcely deserves this reputation, for on examination we find it to be a surface-well loaded with organic matter (containing, according to Mr. Wanklyn's analysis, above 0·10 of albuminoid ammonia), and this probably of organic origin. The water from the pump in Kensington Gardens, near the lodge, is also a bad and dangerous water. On the other hand, the famous pump in Lincoln's Inn, respecting which inquiries have recently been made, proves to be a very pure natural water. This is one of the few pumps in the metropolis which is supplied from a deep well; it deserves its popularity, and may be drunk with safety. The water is in every respect an excellent water. White's Club prides itself on the possession of a well from which it draws all the drinking-water used in the club, and this water is supposed to be of a very aristocratic quality. Examination, however, shows that this water is evidently derived from a surface well, that it is about as pure as ordinary London drinking water as supplied by the better class of ordinary metropolitan water companies, and that its main peculiarity, from which it probably derives the flavour which gives it its repute, is the presence of about fourteen grains of common salt to the gallon. Berkeley Square possesses a venerable-looking fountain, erected through the munificence of a former aristocratic denizen of the square. The water from this fountain when examined proves, however, to be London Thames water of the worst description, supplied by any water company.

We publish also a letter from Dr. Sedgwick Saunders, the able medical officer of the City of London. It will be seen that although, owing to a regrettable error in the *Times'* report, Dr. Saunders is generally supposed to have differed from us as to the purity of the water of the Aldgate pump, he does, in fact, entirely concur with us. We trust that these city pumps will be closed without delay.

Notes of the Week.

THE number of vaccinations in Ireland from 1864-74 increased from 131,426 to 139,587 cases.

THE amount of medical relief in Ireland during the decade of 1864–74 has decreased from 888,835 cases to 687, 165.

IN the weekly health report of the City of Edinburgh, all the twenty-two deaths from zymotic disease are from scarlet fever, except one.

IN the proposed Edinburgh Police Bill, there is a clause requiring medical men to report every case of infectious disease under their care to the medical officer of health under penalty of a fine. A remuneration of *2s. 6d.* is to be given for each such report.

IT is stated that the Royal Humane Society has received from the Lords of the Admiralty an official report of the gallantry shown by Surgeon Scott, in saving the life of a medical officer who had jumped overboard from that ship.

UNIVERSITY COLLEGE, LONDON.

FACULTY of Medicine: Messrs. Percy Edward Shearman, A. H. Nicholson Lewers, and Robert Spence Walton have obtained the entrance exhibitions of *30l.*, *20l.*, and *10l.* per annum respectively, tenable for two years.

SCARLET FEVER IN THE METROPOLIS.

AT the meeting of the Metropolitan Asylum Board the committee of the Homerton Hospital reported that, owing to the increase of scarlet fever in the metropolis, they had re-opened the small-pox hospital for the treatment of fever patients. At Stockwell there are now 104 fever cases under treatment.

PARISIAN PERILS.

VISITORS to Paris at present should be very careful not to drink any but boiled and filtered water. Typhoid fever, which always haunts that metropolis, is just now particularly fatal. There were fifty-two deaths recorded from it last week; say, one thousand cases.

A SANITARY APPOINTMENT.

THE Local Government Board have authorised the appointment of a medical officer of health for the Atcham Bridgnorth, Church Stretton, Cleobury Mortimer, Clem Forden, Ludlow Madeley, Newport Shiffnell, and Tenbury rural districts, and the Much Wenlock and Tenbury Wells urban sanitary districts. The future salary is reported to be *800l.* per annum.

SCARLATINA IN IRELAND.

SCARLATINA exists to a considerable extent in various parts of Monaghan; and Dr. Burke, inspector of the Local Government Board, has recommended that the guardians, as the sanitary authority, should use their influence with the managers of the public schools in the district, with a view of having them closed during the prevalence of the disease; which suggestion the guardians have signified their intention of complying with. In Londonderry, during the last three months, forty-two deaths were registered as occurring from this affection, a number equal to one-fourth of the total deaths.

A SIGN OF THE TIMES.

THE meeting of the Home Counties District Association of Municipal and Sanitary Engineers and Surveyors at Oxford, on November 5, is postponed *sine die*, in consequence of the floods.

THE KEIGHLEY BOARD AND THE VACCINATION QUESTION.

AT the last meeting of the Keighley Board of Guardians about fifty letters were read in answer to an anti-vaccination memorial which had been sent by the board to all the boards of guardians in the United Kingdom. Not one of the replies concurred with the opinions expressed in the memorial. The Merthyr Tydfil Board said 'they thought the Keighley Board must have gone mad, and hoped the law would bring them to their senses.' The Salford guardians enclosed a copy of a resolution which had been passed by them, to the effect that 'the Keighley Board ought to be sent to a lunatic asylum and be made to pay their own expenses.' No remarks were made by the guardians.

CAPTAIN WEBB.

A RECENT graphic 'tracing' of the heart's action, taken by the sphygmograph by permission of Captain Webb, and published by Dr. F. Barnes, affords an useful warning to athletes. It is described by Mr. Myers, surgeon of the Coldstream Guards, an expert on the subject, as typical of a heart that has undergone some inordinate strain and has taken on a condition of irritability, with probably some hypertrophy. It is precisely the character of pulse which he invariably finds in those young soldiers whose hearts have been overstrained in their special calling; a subject to which he has devoted some attention.

It is only an exceptional organism that can endure the terrible strain involved in great athletic feats. Many a fine young fellow has been irretrievably ruined by such efforts, and very few are benefited.

AN ARTISANS' WATERING PLACE.

A PROJECT is on foot for establishing at Salt Dean, near Brighton, a sea-side village of houses suitable for the resort of artisans, clerks, and others of small means. The houses are to be built and the estate laid out on the best sanitary principles, and suites of rooms or small cottages, are to be let at rents commencing at five shillings a week. Cheap holidays at the sea-side are at least as desirable for the working classes of all kinds as for richer people, and cheap trains to the sea-side are generally so well filled as to show that the million fully appreciate a sea breeze. It may almost be doubted, however, whether a cheap sea-side village will prove very attractive to them. Gay equipages and brilliant costumes, and the other bright sights of some fashionable watering places, are attractive to those who cannot indulge in the luxuries of possession. This outdoor spectacle would be missing, and mayhap such a village would be rather dreary and desolate.

TYPHOID IN TRAINING-SHIPS.

FULLY one fourth of the two hundred boys on the *Cornwall* training-ship have now been attacked with typhoid fever. The epidemic is, therefore, one of a serious character. As usual, the source of infection appears to have been in the drinking-water. From the detailed report in the *British Medical Journal*, it appears that the drinking-water has been brought alongside in an uncovered boat, occasionally used for the conveyance of passengers and stores, and exposed to sources of contamination, such as cannot fail to suggest themselves to anyone acquainted with the most elementary principles of sanitary science. This will now be altered; the painful lesson should not be lost on other training ships. Attention must also be directed to the inconvenience and risk attending the present mode of conveying boys suffering from fever in open boats from their ships to the Seamen's Hospital. It is to be hoped that the authorities of the Thames training-ships will bestir themselves to combine to provide a hospital for the reception of cases like the present, so that, if the necessity should again arise, they may be prepared to meet the emergency with promptitude and efficiency.

On the present occasion twenty-six of the fever-stricken boys have been sent to the Greenwich Seamen's Hospital, and twenty-four have been bestowed in a boat-house at Purfleet.

VEGETARIANISM.

THE Vegetarian Society lately held its twenty-eighth annual meeting and *soirée* on Wednesday, under the presidency of Professor Newman. From the report we gather that the society now numbers 734 members, that its income last year was nearly 500*l*., and that a vegetarian restaurant has been opened as an experiment in Manchester. The repast at the *soirée* consisted of tea, bread of various kinds, celery, sandwiches, omelettes and fritters, grapes, and various other fruits. A letter was read from Baboo Keshub Chunder Sen, who wrote that for more than twenty-two years he had lived upon simple vegetarian diet, and a good number of his friends in the Bramah Somaj were stanch adherents of the principle. One of the speakers ventured the assertion that people who eat flesh laid themselves open to rheumatic attacks, but that no vegetarian need fear them. One of the speakers complained that some vegetarians seemed to think 'that fish were vegetables.'

SANITARY IMPROVEMENTS IN BIRMINGHAM.

THE municipal authorities of Birmingham have decided upon the adoption of an important scheme of sanitary and street improvement. In advocating the adoption of the plans which had been prepared, the Mayor (Alderman Chamberlain) remarked that it was impossible to separate the street improvement from the strictly sanitary portion of the scheme, as the carrying out of the latter would be commercially impracticable unless a proper approach from the principal street of the town were made. He estimated the cost of the sanitary reform, after allowing for the improved value of the property, at 265,000*l*.; the total cost, including street improvements, would be 530,000*l*. For this sum the Corporation would become the ultimate freeholders of forty acres of land; they secured the power to reconstruct the whole of the dwellings erected on that area; they threw open four half-acres of streets, and had four half-acres added to the fresh air-spaces of the town. The buildings which they would get rid of, by a singular and gross perversion of the English language, were said to 'accommodate' 9,000 people; but the buildings with which they would replace them would accommodate double that number, and they would not be open to the criticism to which they had, unfortunately, to listen, with respect to the existing edifices. The death-rate of the area which they proposed to reconstruct was nearly double that of the healthier parts of the town, or twenty-six in the thousand. He had calculated that there were 3,000 preventable deaths every year in Birmingham—that was, from diseases which ought not to exist in a town like that. It had been shown that for every person who died from these diseases there were six who were ill. The result showed that 18,000 persons were ill every year in Birmingham from preventable diseases. Reckoning their loss of labour and the cost of medical attendance at only 10*s*. per week, there was a total annual cost to the borough of 54,000*l*. After dwelling on the moral as well as the sanitary aspects of the scheme, and citing the experience of Glasgow in proof of the favourable influence of street improvements upon criminal statistics, the mayor explained that the alterations would afford provision for 18,000 persons on land, which now accommodated only 9.000, and the rateable value of the property would be increased ultimately by 6,000*l*. a year, thus reducing the permanent cost of the improvement to 12,000*l*. per annum.

PUBLIC MORTUARIES.

CERTAIN unpleasant occurrences with regard to the disposal of dead bodies whilst awaiting a coroner's inquest have again brought the necessity for the establishment of public mortuaries into prominence. Legislative sanction for the erection of such buildings is not wanting, since in the Sanitary Act of 1866 clauses were introduced giving power to the local authority to construct mortuaries and to provide places for *post mortem* examination, etc.; but these clauses being permissive only, such mortuaries have not been very widely established. In consequence of the inconvenience which has arisen from the want of a public mortuary in some of the smaller parishes which help to form the Strand Board of Works, the Board of Works was memorialised, on the resolution of Dr. Joseph Rogers, to seek from Parliament in the ensuing session authority to construct mortuary buildings in the metropolis, in such situations as the requirements of the neighbourhood may render requisite, together with compulsory powers, for the acquisition of the necessary sites.

The Metropolitan Board, however, declined to take up the subject, on the grounds that the mortuary question is beset with difficulties in London, and is one which should be dealt with by the local boards and not the Metropolitan Board. Under these circumstances it will, therefore, become necessary to seek from the Home Office or the Local Government Board in the ensuing session of Parliament such alteration in the law as will effectually deal with the question.

IS SELLING DISEASED MEAT IMMORAL?

A WEST country parson has sent a remarkable letter to the *Times*, which gives us some interesting information concerning the quality of some of the 'first-class beef' which finds its way to the London market. He states that one of his parishioners, a tenant of his glebe, lost a fine cow during last week. The animal died of inflammation of the kidneys, and the worthy vicar was expressing his condolence at what he considered would be a heavy loss for his tenant, when to his astonishment he was informed that not only had the farmer suffered no loss from the death of the cow, but that he had actually, as it appeared, proved a gainer, for the diseased carcass of the cow had been promptly sent 'to London' where it had been sold as first-class beef.' The first impulse of the vicar, was, he says, to denounce the farmer as 'a murderer, a thief, a false witness, and a covetous man;' but remembering that the individual in question was 'a regular communicant,' he thought better of the matter, and consulted his curate. The curate threw some light on the subject; for he said that the sending of diseased meat to London was 'so common a practice that it was not looked upon as a crime.' This is cheerful news for flesh-eating Londoners.

At the Guildhall Police Court, this week, Wm. Kynaston, a butcher, of Ditcheat, near Evercreech, Somerset, was, for having sent four quarters of beef to the market unfit for human food, sentenced to one month's imprisonment.—Frederick Steed, a farmer, for a like offence, but with mitigating circumstances, was fined 20*l.* and 5*l.* 5*s.* costs, which he paid. The energy and irrepressible audacity of this class of offenders are not to be repressed by the heavy penalties and public odium attaching to the offence.

SEWAGE FARMING AT MERTHYR-TYDVIL.

THE annual report of Dr. Dyke, the medical officer of health of Merthyr-Tydvil, bears testimony in favour of a well-managed sewage farm. Speaking of a plot of twenty acres laid out to receive sewage on Mr. Bailey Denton's plan (intermittent downward filtration), Dr. Dyke observes how cleanly, odourless, and perfect in all its details is the action of the system. As part of his duty, he has 'from time to time examined the water flowing out, and satisfied himself that there has been no perceptible increase in the amount of organic matter dissolved therein.' For in July, 1872, it was proved by the investigation made by Dr. Frankland to contain only one part of organic matter in 200,000 parts of water; and in 1874 it was found still just as free from impurity, showing that no saturation of the soil went on, the growth of vegetables on the surface, and the aeration effected by drainage doing the work of purification effectually. In another part of the report, which treats of the classes of disorders met with in the district, Dr. Dyke recalls certain prophecies, made when the sewage-farm system was introduced, that the vegetables first grown under its means would act prejudicially on the public health. So far from this being the case at Merthyr, there are hundreds of young children brought up on the milk of store-kept cows, fed partially on grass grown on sewage-irrigated meadows; yet the mortality among them from diarrhœa and similar complaints is exceptionally low, and all medical men in the district agree that this type of disease among persons of all ages has diminished of late years, for the plain reason, no doubt, that whilst sewage-irrigated vegetables have been introduced, a good water-supply and a thorough system of drainage have been introduced with them.

THE ARTISANS' DWELLINGS ACT.

DR. SEDGWICK SAUNDERS, medical officer of health for the City of London, has reported 478 houses, comprising 2,116 rooms—in which 4,315 persons reside—covering 380,369 square feet, or nearly eight acres and three-quarters, distributed over the City, as 'unfit for habitation if a high standard of health is to be maintained.' This looks like business, and will be hailed with satisfaction by sanitary reformers. Some isolated parishes in the metropolis, Birmingham, and the City of London, have now the honour of leading the crusade against the conditions inducing disease and decrepitude. The *Lancet* trusts it will be remembered by corporations and local sanitary authorities of all classes that when once a medical officer has made his official 'representation' the case is out of his hands; he has done his duty. It would be illegal for him to amend his report so as to meet the wishes or the convenience of his employers. The onus of declining or determining to carry out such repairs as the 'representation' may declare necessary rests entirely upon the sanitary authority, and, whatever decision they may arrive at, the communication of the medical officer's report to the confirming authority (in London the Home Secretary) is a proceeding which cannot be evaded. If medical officers bear in mind where the appeal now lies, they will not hesitate to discharge their public duty.

At the Metropolitan Board of Works this week Mr. Runtz stated that a plot of land in Liquorpond Street was available for the erection of temporary dwellings while the improvement in Holborn was in progress; but the Metropolitan Street Improvements Act, 1872, provided that the Secretary of State could not sanction building on this site until all the plots intended to be acquired under that Act had been purchased. This would cause a delay of more than a year in carrying out certain improvements; and he therefore moved that a letter should be addressed to the Secretary of State, asking if he could modify the obligations of the board in this respect. Mr. Newton objected to any operations under the Local Act being mixed up with the operations under the Artisans' Dwellings Improvement Act, 1875. After a short discussion, the resolution was passed.

OUTBREAK OF SMALL-POX IN LEEDS.

ONLY five fatal cases of small-pox were registered in the week ending the 25th ult. in eighteen of the largest English towns, estimated to contain a population of more than six and a half millions of persons; of these, four occurred within the borough of Leeds. The Registrar General, in his last weekly return, calls attention to the fact that the Leeds Small-pox Hospital contained on the 25th ult. thirty-three patients suffering from this disease, and that fully as many other cases existed in other parts of the town. This outbreak is in great measure due to the

conduct of a weaver named James Herring, who was on the 24th charged at the Leeds police court with having exposed certain clothing infected with small-pox, and was sentenced to a fine of 5*l.*, or in default to two months' imprisonment. It appeared in evidence that the weaver's son was suffering from small-pox on September 3, and died on the 9th, having been personally nursed at night by his father, who nevertheless continued to attend during the day at a linen factory, where he had charge of a room in which sixty girls were engaged. The result of this was that ten or twelve of the girls were attacked with small-pox, of whom three had died previous to the hearing of the case. The magistrate in sentencing the prisoner said there could be no doubt that he had been guilty of 'a very imprudent act,' which appears to us to be an exceedingly mild definition of his offence. It was stated that this weaver has five children, not one of whom has been vaccinated, and up to the time of the hearing twenty-six cases had been directly traced to the outbreak in his family, four having proved fatal.

It may be interesting to state that this prosecution took place on behalf of the town clerk of Leeds, and that the information was laid under section 126 of the Public Health Act, 1875, which enacts that 'any person who gives, lends, sells, transmits, or exposes, without previous disinfection, any bedding, clothing, rags, or other things which have been exposed to infection from any such disorder, shall be liable to a penalty not exceeding five pounds.' The wording of this section hardly suggests the probability that it was specially intended to meet such a case as the one above mentioned, to which it was applied, and although it is disappointing not to find one of the 342 sections of this act which applies more clearly to the offence with which this Leeds weaver was charged, it is useful to know that this section 126 can be made to answer the purpose, and at any rate will carry a conviction.

Reports.

THE PUMPS AND WELLS OF LONDON.

IN calling for the closing of the Aldgate Pump, it was far from our intention to call for an indiscriminate closing and disuse of London pumps and wells. We expected that, when submitted to proper investigation, the water from some sources would prove to be good; and on prosecuting the inquiry such appears to be the case.

Leaving the City we have gone westward and collected samples of water from several well known sources. The

Date 1875	Name of the Water	Grains per Gallon			Parts per Million	
		Solids	Chlorine	Hardness	Free Ammonia	Albuminoid Ammonia
Oct. 25	1. St. Govor's Well, Kensington Gardens	27·	3·4	14.	0·08	0·24
Oct. 25	2. Pump near the Lodge in Kensington Gardens	42·	3·5	16·	0·00	0·14
Oct. 26	3. The Fountain in Berkeley Square	20·	1·1	15·5	0·01	0·17
Oct. 26	4. The Well in White's Club, St. James's	47·	8·3	13·5	0·01	0·08
Oct. 26	5. The Pump in Lincoln's Inn	21.	1·1	17·5	0·02	0·05

results of the analysis show the need for an inquiry of this description, in some instances justifying the high repute which certain waters have acquired. Though popular judgment has sometimes been at fault as to the qualities of a water, it would be as great a mistake to condemn a water on account of its popularity as to select it for domestic use because of its high local repute.

The five waters on which we are reporting illustrate the great variety that there is in the quality of well waters. The table shows the results obtained from the analyses executed for us by Mr. J. Alfred Wanklyn.

In commenting on these figures, we note that the water of St. Govor's Well belongs to Class III., being very dirty water (albuminoid ammonia above 0·10). The circumstance of there being high chlorine in the water renders it possible that the organic matter is of animal origin.

Water 2, from the pump in Kensington Gardens, is not good. It likewise belongs to Class III.

Water 3, from the fountain in Berkeley Square, is evidently water from a Thames Water Company, the solids, chlorine, and hardness corresponding exactly. It is, however, not a favourable specimen, being of the quality (albuminoid ammonia 0·17) that is associated with certain bad Thames companies which cannot be induced to filter efficiently. It likewise belongs to Class III.

Water 4, from White's Club, is well worth attention. In the first place, the albuminoid ammonia is moderately low, viz. 0·08, and the water, therefore, falls into Class II., being as pure, organically, as ordinary drinking water. We are informed that this water is highly prized, and we note that the chlorine is high, viz. 8·5 grains per gallon. This is equivalent to 14 grains of common salt per gallon, and affords an example of the partiality for a little salt in drinking-water.

Water 5, from the very popular pump in Lincoln's Inn, belongs to Class I., that is to say it is a very pure natural water. Most deservedly this pump is popular.

We have paid no attention to the nitrates in these waters, because the nitrates throw no light on the degree of purity of well waters, being common to pure deep-spring water and to impure surface-water. Indiscriminate condemnation of good and bad water together attends trusting to the nitrates, and accordingly we avoid it.

WE have received the following communication from the Medical Officer of the City of London.

SIR,—Much misapprehension having arisen in consequence of an unfortunate misprint in the notice of my report upon the city pumps, inserted in the *Times* newspaper of Wednesday last, and your own issue of to-day having referred to the subject, I am induced to forward you a tabular statement of the analyses made from the waters of the only pumps now in use in the City of London, viz., Aldgate (at the junction of Fenchurch Street and Leadenhall Street), Bartholomew Lane, Crutched Friars, and Fann Street. These are all that remain of the thirty-five pumps condemned by my predecessor in 1866.

The table shows the results of twelve determinations, of which ten were made by myself, and two by Professor Wanklyn, the whole being analysed by the very delicate and beautiful process described by that eminent chemist in his useful treatise upon 'Water Analysis.'

Your readers will perceive that in compiling this table I have prefixed three admittedly good waters by way of comparison.

The variations noticed in the different samples of the same waters depend upon the time passed between the drawing of the water and its analysis, upon the state of the rainfall, and on other circumstances. Thus, if a sample be left for a month or two, the free ammonia increases enormously, so that no two analyses can compare truthfully

unless taken at the same time and analysed immediately. Very bad waters are known to change from day to day—a fact which should be borne in mind in examining waters in hot climates.

TABLE OF ANALYSES.

	Grains per Gallon		Parts per Million	
	Solids	Chlorine	Free Ammonia	Albuminoid Ammonia
GOOD WATERS				
New River . . .	17·7	0·00	0·00	0·06
Thames . . .	18·5	1·2	0·01	0·06
Stand pipe from cab rank	25·	1·2	0·00	0·04
BAD WATER				
Aldgate pump . .	103·	10·5	0·72	0·12
Ditto	108·	9·4	0·48	0·08
Ditto	111·	10·3	0·56	0·10
Ditto	not taken	10·1	0·58	0·11
Ditto	88·	11·1	0·01	0·76
Ditto	not taken	10·5	0·25	0·26
Bartholomew Lane .	42·	4·3	1·80	0·08
Ditto	50·	4·1	1·40	0·08
Ditto	not taken	not taken	2·20	0·10
Crutched Friars . .	73·	4·3	0·04	0·10
Fann Street . . .	142·	9·9	2·20	0·22
Ditto	not taken	not taken	2·10	0·16

Occasionally waters, after they have been kept a long time, vegetate, when the free ammonia may be entirely absent, having become converted into vegetable albumen, or tissue, in which case the albuminoid ammonia will be found very high.

WM. SEDGWICK SAUNDERS, M.D.,
Medical Officer of Health and Public Analyst for the City of London.

13 Queen Street, Cheapside,
October 23, 1875.

Extract of my Report presented to the Commissioners of Sewers on Wednesday, October 20, 1875.

'SINCE I last reported to your honourable court upon the expediency, upon sanitary grounds, of shutting up for ever the pumps now in use in the City of London, public attention has been repeatedly and forcibly directed to the chemical qualities of the waters obtained from them, and numerous applications have been made to me on behalf of the general public for further information upon the subject. I beg, therefore, again to express my conviction that the continued drinking of these waters, or even their employment for domestic purposes, is fraught with serious danger to the public health; and in order to demonstrate the ground upon which I base my opinions I now lay before you the results of some analyses made by myself and others at various periods and in different weathers during the present year.

'At the present time there are only four pumps in use in the City, and it will be seen by reference to the tabular statement (appended) that the whole of these waters are so loaded with organic matters as to be entirely unfit for human consumption, and the imperative demands of public health require that immediate measures be taken for their being closed either by the intervention of the Ward authorities or, failing this, by direct application to the Home Secretary,' etc., etc.

THE INDUSTRIAL DWELLINGS COMPANY.

A SPECIAL general meeting of the members of the Improved Industrial Dwellings Company was held in the Mansion House on Wednesday to consider a report of the directors sanctioning the creation of additional capital, to the amount of 250,000*l.*, by the issue of 25,000 shares of 10*l.* each. The chairman, Alderman Sir Sydney Waterlow, M.P., in addressing the meeting, said they had been called there that day for the purpose of considering a proposal of the greatest possible importance to the future welfare of the company, namely, to double its present capital and increase its resources to nearly a million sterling, including the borrowing powers under the Labouring Classes Dwellings Act, 1862. The board had endeavoured from the commencement to carry on all their operations with the greatest economy consistent with efficiency. The preliminary expenses of forming the company were less than 50*l.*, and the second issue of capital, amounting to 125,000*l.*, was nearly all taken up by the old members, and the whole cost of placing it amounted to 23*l.* odd. The present share capital amounting to 250,000*l.* would be fully paid up by Christmas. The company had received from the Public Works Commissioners 84,000*l.*, and it had before them an application for further loans amounting to 54,000*l.* It also proposed at the proper time to apply for a further sum of 71,000*l.*, principally for the completion and on the security of the Bethnal Green estate. The total expenditure on capital account was 334,540*l.* For works in progress at Westminster, Goswell Road, and Bethnal Green, the company required 75,700*l.*, and for further buildings at Bethnal Green not yet contracted for about 57,000*l.*, making a total of 467,240*l.*, or about 8,000*l.* more than its present available resources from capital and borrowing powers. The annual gross rental derived from property at present occupied was 30,064*l.* per annum. The estimated rental of buildings in progress, and to be completed with the present capital, was 21,800*l.*, making a total gross income of 51,864*l.*, or rather more than 11 per cent. on the cost of the property. The company, during the past three years had lost nothing by bad debts or defaulters, and the cost of management had averaged 4½ per cent. on the income. The directors received no fees for their services. For the last seven years there had been a large surplus profit after paying the dividend of 5 per cent., and the company had now 19,000*l.* to the credit of the reserve fund for the equalisation of dividends, after crediting all the other reserve funds and paying more than 4,000*l.* to the loan commissioners in redemption of advances. These, he thought, were most satisfactory details. It might be asked, 'Have the philanthropic objects for which the company was formed been carried out as successfully as the commercial part of the undertaking?' In reply to that he would cite a few facts in connection with the company's working. It had, at present, 1,596 tenements in the occupation of 6,750 persons; 603 tenements were in course of erection to accommodate 3,000 other persons, and about 600 tenements had still to be contracted for, to give room for 2,500 others. The existing capital and loans would therefore provide 2,799 tenements to accommodate 12,150 persons. The tenements were constructed in various parts of London. The rate of mortality in the company's dwellings during the nine years in which it had been formed had been 16·2 per 1,000, as against an average of 23·6 per 1,000 in the metropolis. In the metropolis the density of population was forty-two per acre, although in St. George's-in-the East it was 197, and in the company's dwellings about 750 per acre; yet, the death-rate per 1,000 of persons over one year of age was seventeen in the metropolis, and only 10·35 in the company's dwellings. Although the birth-rate was five in the 1,000 more in the company's dwellings than in the metropolis generally, the death-rate of infants was only 1·7 higher in its dwellings than in the metropolis, thus showing that the conditions of occupancy in the dwellings were as favourable for infants as they were for persons of riper years. The company had lately negotiated for sites at Westminster; Peerless Street, City Road; Pimlico; and for a large site at Islington; and it also anticipated that, within a very short time, the Metropolitan Board of Works would be in a position to offer it some very favourable sites in Liquorpond Street, Willow Walk, Shoreditch, and in other places along the line of the new street from Bethnal Green to Holborn. Several improvement schemes had been prepared for the consideration of the

Metropolitan Board of Works, one adjoining Leather Lane having been already sanctioned. In conclusion, the chairman proposed the adoption of the report, recommending the creation of additional capital to the amount of 250,000*l.* by the issue, when required, of 25,000 shares of 10*l.* each. The motion was seconded by Mr. Alderman Finnis, and carried unanimously. The meeting closed with a cordial vote of thanks to the chairman for presiding, and to the Lord Mayor for allowing the use of his official residence for the meeting.

DUBLIN SANITATION.

THE following proceedings are reported in a well-informed Dublin paper, as having taken place in the Southern Division police-court of Dublin :

Christopher Daly, of Maclean's Lane, an ash-pit cleaner, and several men in his employment, were prosecuted by Sanitary Inspector Halligan for creating a nuisance in Maclean's Lane, by accumulating manure heaps in their yards. It appeared that the defendants were in the habit of depositing the contents of all the dust-holes and ash-pits they emptied in their yards until a sufficient quantity had been accumulated for disposal to manure purchasers. This the sanitary inspectors stated was prejudicial to the public health of the district. Mr. Boyle, C.E., and Dr. Mapother attended on behalf of the Public Health Committee. The former suggested that the magistrate should make an order requiring the defendants to mix the manure accumulations with coal-ashes, or road-scrapings, which are deodorisers, and would counteract the prejudicial influence of the nuisance. Dr. Mapother concurred in this view. Mr. Rynd, on the part of the defendants, undertook to adopt the remedy, and the case was allowed to stand for four weeks.

The report omits to state that it is not only the cleansing of 'dust-holes and ash-pits,' but also privies and piggeries which are collected in this place. Maclean's Lane is situated in the centre of a densely populated neighbourhood, and is surrounded on nearly all sides by tenement houses. This nuisance, or rather series of nuisances, have been complained of constantly for many years, and the Dublin Sanitary Authority have gone through the sham of having these people fined—but none paying the fines—time after time. Now, the 'executive sanitary officer' deliberately proposes that the nuisance should be perpetuated under the protection of the sanitary authority and the 'consulting sanitary' officer supports the 'executive officer.' We should like to have Dr. Mapother's idea on what are the disinfecting and deodorising powers of such ashes and road-scrapings as are to be found in Dublin. Does not Dr. Mapother know perfectly well that the road-scrapings of a large city and its suburbs require themselves to be deodorised and disinfected? If he does not, the sooner he ceases to advise the Dublin magistrates the better. Does not Dr. Mapother also know that the ashes collected in Dublin are already more than fully saturated with offensive organic matter, so as to be quite incapable of deodorising anything? We are utterly surprised and amazed at Dr. Mapother's statements, as reported not in one, but several Dublin newspapers. We are not surprised in the least at the 'executive sanitary officer's' statement, because he recently took a great deal of trouble to demonstrate what his ideas of 'fairly clean' were, which, with all due respect, we had to consider not to be in accordance with received opinion. Applying the same phraseology to Maclean's Lane that he did to the Dublin dairy farm, we presume when the filth, collected by the ash-pit cleaners, has been mixed with filthy ashes, and wet and stinking road-scrapings, that the 'executive officer' will describe the matters complained of as 'fairly inodorous.' It seems never to have struck either Mr. Boyle or Dr. Mapother that all this mixing and deodorising, and manufacturing of manure, is to be carried out under the windows of the houses of the poor in a crowded and unhealthy district.

The Committee of the Dublin Sanitary Association seems to be alive to the state of things, as, at its last meeting, the attention of the committee having been called to a report of proceedings in the Southern Police Court relative to the deodorising of certain manure heaps in Maclean's Lane, by means of mixing them with road-scrapings and coal-ashes, it was resolved that a sub-committee be requested to consider the matter, and report thereon to this committee. We fancy the sub-committee will tell a different tale to that told by the officers of the sanitary authority.

Medical Officer's Report.

THE SANITARY CONDITION OF BIRMINGHAM.*

We are glad to see that Birmingham is about to put her shoulder to the sanitary wheel both earnestly and speedily, so as to regain the *prestige* she has enjoyed in past times as being the healthiest large town in England. Dr. Hill's last report states that, 'The death-rate for 1874 is no less than 2·45 per 1,000 higher than the average for the nine years 1865-73 inclusive,' and 'in no year of this period has it been so high by so much as nearly 1·00 per 1,000.' 'The birth-rate has been becoming higher year by year since 1870.' This high birth-rate (41·3) Dr. Hill says 'is a satisfactory because unfailing indication of the prosperity of the town; and prosperity involves some of the principal conditions favourable to health.' So, whatever Dr. Letheby and his disciples may think of this fact, Dr. Hill in no way attempts to blame the exceptionally high birth-rate as partly the cause of the highness of the death-rate.

Dr. Hill does not mince matters, but at once impeaches the water-supply. 'I cannot help thinking that our water-supply is greatly instrumental in bringing about the present state of things.' Diarrhœa in 1874 stood third in order of fatality, and the year before it was the most fatal of all the zymotics. 'Analysis of the well-waters of the town show that they are greatly contaminated by sewage matters, largely of excrementitious origin.' Even the waterworks water, though much better than the well-water, contains organic impurities 'much too high, and very probably productive of diarrhœa.'

Another evident cause of ill-health is defective house construction. 'Out of 70,500 houses inspected nearly 20,000 were found with windows not admitting of being opened at the top, thus rendering proper ventilation impossible.' 'Another and still more vicious structural defect is that of building houses back to back or without back-doors. Such forms of construction have led to the most serious consequences to the health of towns and to enormous expense for the removal of the defects. It is clearly the duty, therefore, of every town to see that such a state of things is not perpetuated.' Dr. Hill might have added that in this objectionable matter of back-to-back houses Birmingham has out-Heroded Herod. In Birmingham it is a common custom to build two houses facing the street with an entry between them. This entry communicates with a court at the rear, round which, open on every side, houses one room deep are built. In the centre or corner is the midden, and in close proximity the well. Thorough ventilation in such *sacs* is impossible and infectious disease once in must run all round ere it wears itself out. Long ago the law in force in Manchester, Salford, etc. should have been also the law for Birmingham, viz., through and through streets, with separate yards and outhouses to each house, these yards opening on to a passage which must communicate directly at each end with a street.

* Reports on the Health of the Borough of Birmingham for the year 1874, and for the quarter ending April 3, 1875. By Alfred Hill, M.D., Medical Officer of Health, Analyst to the Borough.

Also a minimum space between the backs of neighbouring houses. The natural position of Birmingham is not in all districts favourable to a rectangular system of streets, but even in parts where such a system might easily have been carried out nothing has been done to prevent the repetition of old and known defects. A great deal too much liberty and licence has been allowed in Birmingham to individual builders; and so long as the street elevations have been fairly decent, the back—and, in a health point of view, the most important—premises have been left to take care of themselves.

Dr. Hill calls attention to the natural advantages of the town. 'The town has an elevated position, roughly from 200 to 600 feet above the level of the sea, a gravelly and sandy soil, and a surface so disposed as to favour rapid drainage.' The fact is Birmingham has for centuries been trying to commit sanitary suicide, and has at last nearly accomplished her foolish aim. It will, therefore, take years and years to retrieve the mistakes of the past; but the great sanitary measures about to be commenced in that city will, in all probability, remove most, if not all, of the evils pointed out in this report.

Law Reports.

THE OLD ADULTERATION ACT.

LAST week a druggist in Greenock was charged at the police-court with having sold two ounces of citrate of magnesia, which, on analysis, was found to be a preparation containing carbonate of soda, tartaric acid, sugar, sulphate of soda, and a small portion of citrate of magnesia. Mr. McGowan, public analyst, deposed to having found these ingredients in the sample he analysed. From the evidence of a number of witnesses called for the defence, it appeared that what is generally sold in chemists' shops as citrate of magnesia, consists mainly of carbonate of soda and tartaric acid, with a little sugar, and does not contain a trace of citrate of magnesia. Evidence was also given to the effect that none of the ingredients were injurious to health. The public prosecutor asked for a conviction, contending that there was no need to prove that the mixture was injurious to health. The magistrate considered the case not proven. It was the last case to be tried under the old Act.

A LOCAL BOARD MEMBER CONVICTED OF BREACH OF BY-LAWS.

AT the Chesterfield police-court, Mr. Coates, property owner, Newbold Moor, has been summoned at the instance of the Newbold Local Board for an offence against the by-laws.—Mr. Jones said he appeared on behalf of the Local Board to support a summons taken out against Mr. Coates, who was one of the members. The case was that Mr. Coates had committed a breach of the by-laws he had himself assisted in making, by neglecting to submit for the approval of the board the sections for some houses he was building. The proceedings were not taken through any ill-feeling on the part of the other members of the board towards Mr. Coates, but they were compelled to bring the case before the Court, in order to vindicate themselves before the public from any suspicion of partiality in carrying out the law.—Mr. Binney said he had no answer to the summons, but Mr. Coates had been prevented from complying with the by-law in the first instance through some delay in getting his plans. He thought the justice of the case might be met by the summons being adjourned for a week for Mr. Coates to furnish sections, or by payment of a nominal fine.—Mr. Coates having agreed to furnish the sections, the bench imposed the nominal penalty of 1*l.* and costs.

NUISANCE FROM IMPURE WATER.

THE Ashton county magistrates have issued an order on Mr. Cowper, cotton-spinner, Hurst Brook, for the abatement within three months of a nuisance arising from two reservoirs containing sewage-water which had been 'heated-up' so as to render it fit for steam purposes. The proceedings were taken by the local board, under the Public Health Act. The defendant claimed a sort of user in excuse, and said that if people did not want nuisances they had better leave Lancashire.

'MILK AND WATER.'

A PAISLEY farmer, it appears, tells his customers plainly that he is selling milk and water, and holds that having said so he was beyond the scope of any Act of Parliament as much as the grocer who sells coffee mixed with chicory. The magistrate before whom the case was brought promised to convince the farmer of his error.

No further report of the case has reached us, which we regret, for the point raised is by no means free from doubt, having regard to the wording of section 9 of the new 'Sale of Food Act.'

BRIEF NOTES OF CASES.

MANDAMUS AGAINST A BOARD.

1875. *Reg.* v. *Keighley Guardians.*—Refusal to enforce vaccination. Application for mandamus at the instance of L. G. B.—Rule absolute. (39 J. P., 309 and 360.)

LEGAL PROCEEDINGS.

1875. *Drew* v. *Harlow.*—Street obstruction by costermonger's barrow. Evidence of by-laws.—By-laws held not proved by the mere production of a printed copy. (39 J. P., 420.)

MARKET.

1875. *Morgan* v. *Kingdon.*—Local Act. Market. Alleged infringement.—Held that gingerade was not a 'marketable commodity,' within the meaning of the Act. (39 J. P. 471.)

POLLUTION OF WATER BY SEWAGE.

1875. *A. G.* v. *Hackney B. W.*—Pollution of water-course by sewage. Defence that the water-course was a sewer held bad.—Injunction. (44 L. J. Ch. 545.)

A NEW SCHEME FOR RATING.

AT a recent local government inquiry at Stevenage, before Mr. J. T. Harrison, a little incident cropped up which is so characteristic of small local boards that we do not wonder at Mr. Harrison announcing that he should direct the attention of the Local Government Board to the matter. Our readers will recollect a provision of the old 'Public Health Act, 1848' (kept alive by the 'New Public Health Act') to the effect that in cases where the whole of a parish is rated for certain improvement purposes the cost of highways is to be defrayed out of the general district rate, and not out of a highway rate under the Highway Acts. Rated to a general district rate, the land obtains an extensive exemption which it would not obtain under the Highway Acts. The Stevenage local board, acting exclusively in the interests of the agricultural part of the district, and having spent the enormous sum of 40*l.* in sinking useless wells, has, on the strength of this outlay, decided that its case is within Section 216 of the 'Public Health Act, 1875,' and that it is at liberty to throw on the general district rate the burden in its heaviest form of maintaining the roads of the district. As Mr. Harrison said, the course adopted at Stevenage is not exactly a violation of the letter of the law, but assuredly it is a violation of the spirit. Looking at the matter in a more general way, it may be cited as another instance of the danger of entrusting too much discretionary power to a very small local board.

THE PROTECTION OF INFANT LIFE.

AT the Uxbridge sessions M. A. Watts was summoned 'for receiving for hire two infants under the age of one year for the purpose of nursing apart from their parents for a longer period than twenty-four hours, the house not being registered in accordance with the Infant Life Act.' J. Spinks and E. Matthews, domestic servants, gave evidence showing that they each had a child under the defendant's care at the same time. For Spinks's child she received 6*s*. per week, but defendant's sister came forward and stated that the other child was received from her because it was ill, and she, having a family, could not properly take care of it. There was no arrangement made as to payment. Constable Kemp stated that on August 5 he attended an inquest on the body of Matthews's infant, when defendant admitted that it had been in her possession four days, and that she had expected to receive 6*s*. per week for it, and in consequence of this statement the coroner ordered the present proceedings. The woman now said that she was so confused when before the coroner that she hardly knew what she was saying. She was certain that no arrangement had been come to at that time, but, of course, she expected to receive remuneration. As it was the first case that had been brought before the bench, and Inspector Eames did not press for a conviction, the summons was dismissed, but the chairman informed defendant that if she received two children to nurse again without her house being registered, she would be liable to a fine of 5*l*., or six months' imprisonment.

ADULTERATED LEMON-JUICE.

AT the Westminster police court, G. Purdon, oilman, 20 King's Road, Chelsea, was summoned under the Adulteration of Food Act for selling adulterated lemon-juice. It appeared from the evidence of the food inspector that he purchased two bottles of lemon-juice of the defendant, and told him he should submit them to the analyst, and that he could see it analysed; but defendant declined.—Dr. A. W. Barclay, food analyst, proved that he had received one of the bottles. He found it to contain twenty grains of sulphuric acid in excess. Action had been taken in consequence of complaints that pure lemon-juice could not be bought, and an analysis of a previous sample had shown that the defendant's was adulterated. On the first bottle was a label, which stated that the fact of the lemon-juice having passed the Customs was a proof of its being genuine. There should be twenty-nine grains of citric acid in a pint of lemon-juice, and in this there were only six. The witness said that lemon-juice was only used as a cooling summer drink, and was given to persons suffering from rheumatism. In the case of rheumatic patients sulphuric acid was deleterious. In this lemon-juice sulphuric acid was detected 'free'—that is, added, and not combined with potash. In a pint of lemon-juice pure there should be five grains of sulphate of potash. Persons purchased lemon-juice at oil shops to use medicinally on account of it being cheaper than if purchased at a chemists's.—Mr. Smyth, for the defence, said that for thirty years Purdon had carried on this business, and was a man of the highest respectability. This lemon-juice was purchased wholesale from a firm in the Old Kent Road, and retailed by the defendant as he received it, and the new Act, which would soon come into law, would have operated in his favour. The defendant and his family had used it for some time, and liked it, and as there was no injury likely to arise from its use he hoped the magistrate would come to the conclusion that it was not a case contemplated by the statute.—Mr. Arnold said the question was, did the defendant sell an article which was not what it professed to be, and according to the evidence of the analyst the juice was adulterated. He was afraid he had no alternative but to convict, and fined the defendant 1*s*. and 2*s*. costs. Had he been present, he would not have inflicted the penalty, but ordered him to come up for judgment.

NON-REPAIRS OF A STREET: ACCIDENT TO A CAB.

Fisher v. *Lightfoot and the Corporation of Sheffield* was a claim for damage arising out of an injury to a cab and horse, caused by alleged negligence on the part of the Corporation and their contractor, Lightfoot, in leaving a dangerous hole in the road on Attercliffe Common. On May 13, 1874, a brother of the plaintiff was driving a cab when his horse, without warning, fell forward into a hole. The fore wheels went down into the hole; the fore part of the cab was broken; the horse plunged, and finally ran away. The driver jumped from the cab, and, pursuing the horse, eventually caught it after it had dashed against a telegraph-post. The evidence went to show that there was no light, no fencing, and no watchman on the spot. So far the evidence was not disputed. A difference, however, arose as to whether the Corporation had removed the road and stones set round the tram-rail in their capacity as surveyors of highways or as directors of the tramway company. A great deal of evidence was taken as to a certain 18 in. of granite stones which were next to the outside of the tram-rail, for, by the Act of Parliament, the duty of repairing these 18 in. lies upon the tramway company, and not upon the surveyors of highways. For the Corporation it was contended that if the hole was made by them for the improvement of the highway the Corporation was not liable. That they would only be liable for personal negligence. That having contracted with the defendant Lightfoot, the responsibility was shifted from them to him. The defendant Lightfoot had contracted with the Corporation to do two works—both to lay the tramways, and also to alter the macadam road and improve the roadway. In doing the latter he took up the 18 in. he had laid down for the Corporation as tramway directors. The point whether the work was tramway or highway work was left to the jury.—The jury were unanimous on the fact that it was as tramway work that the 18 in. were removed.—Mr. Dodd contended that under the Highway Act of 5 & 6 Will. IV., and 35 & 36 Vict. c. 79, ss. 7 and 60, the plaintiff was out of Court, as the action was not brought within three months after the act complained of.—Mr. Waddy, for the plaintiff, relied upon the Public Health Act of 1848, which altered the time to six months, and he was upheld by the learned judge. Discussion arose as to whether both defendants were liable; but the judge decided in favour of the plaintiff's contention that both were liable. Verdict for the plaintiff for 60*l*.

Correspondence.

VACCINATION AS A SOURCE OF DISEASE.

(*To the Editor of the* SANITARY RECORD.)

SIR,—A friend of mine took her child to be vaccinated to the surgery of a public vaccinator (ignorant of the new Act), as she understood it was compulsory for her to attend that day, although she verbally gave notice to the doctor that the child was ill and not fit to be vaccinated. He said it must be done or she would be fined 40*s*. (We have since found out they were short of lymph.) Inquiries have been made about the parents and child from whom my friend's child was vaccinated, and she was assured by the doctor, 'O, they were all right beyond suspicion, etc.' The child has now broken out and inflamed all over, with rash and pimples on body, feet, hands, mouth and eyes, and it is further supposed by another doctor it has itch as well. Now other children have been done from this also, where will it end? Further inquiries have been made about the parents from whose child my friend's child was vaccinated, and it has turned out they are not to be depended upon at all. I might say more but I will not. Now, sir, if any disease through the negligence of the public vaccinator has been introduced into the system of my friend's child, either in-

wardly or outwardly, who is to blame, or substantially responsible for the child's future health, or if it dies, where is the remedy? I think, sir, this is a rather serious question, and requires Government interference in the working of the Vaccination Act. I know several children myself from very healthy parents, free from disease, who have had scurvy after vaccination, which has been clearly traced. We talk of the new Sanitary Acts for external cleanliness. How about vaccination? Does it not make the public feel they are never safe in the hands of public vaccinators, when they never trouble to inquire, and ruin the health of a generation for the sake of the fee? This may not be so, but it looks like it, and certainly requires more stringent supervision.

September, 1875. A FATHER.

THE FACING OF TEA.

(*To the Editor of the* SANITARY RECORD.)

SIR,—In common with many persons who have paid attention to such subjects, I am of opinion that the facing of tea ought not to be interfered with by the law.

Tea, the article of commerce, does not mean the leaf in the condition in which it exists when growing on the tea-plant, but the dried and prepared leaf; and part of the customary preparation of green tea consists in colouring or facing it.

We permit the cheese-maker to tint the cheese, the butter-maker to tint the butter, and we allow silk and cotton fabrics to be sold after having been dyed of various colours, and no reason can be urged against the facing of tea, which would not equally apply to the tinting of cheese, etc.

It may be objected that the liberty to face tea is not a very important liberty, and that no practical harm could happen by the suppression of it. But all earnest persons must see that the possibility of rendering effective the legislation for the suppression of real adulteration depends upon the scrupulous avoidance of arbitrary interference with trade, and perhaps the worst result of a frivolous interference with the tea trade would be the crippling of sanitary legislation. J. ALFRED WANKLYN.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

ANDERSON, George Henry, M.D., has been appointed Certifying Factory Surgeon for Lofthouse, Yorkshire.

ARMSTRONG, Leonard, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Dawlish and Wolborough Urban, and the Newton-Abbot Rural, Sanitary Districts: 40*l.* per ann. for two years.

ASHBY, Alfred, M.B. Univ. Lond., F.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Spittlegate Urban Sanitary District.

BOOTH, Mr. John, has been appointed Inspector of Nuisances for the Haslingden Rural Sanitary District for six months at 75*l.* per ann.

BULLMORE, William King, M.D. Univ. St. And., M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Falmouth Port Sanitary District for six months.

CORBET, David, M.R.C.S. Eng. and L.M., L.S.A. Lond., has been appointed Medical Officer of Health for the Kidderminster Urban Sanitary District: 50*l.* per ann. for two years.

DE LA MOTTE, Peter William, L.R.C.P. Edin. and L.M., M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Swanage Urban Sanitary District.

DUCKWORTH, John, Esq., has been appointed Chairman of the Haslingden Urban Sanitary Authority.

DYKE, Thomas Jones, F.R.C.S. Eng., L.S.A. Lond., has been appointed President of the Society of Medical Officers of Health for South Wales and Monmouthshire.

GRAY, Frederick Archibald, L.R.C.P. Lond., M.R.C.S. Eng., has been appointed Medical Officer of Health for the Honiton Rural Sanitary District.

HIGGS, Mr. Walter, has been appointed Inspector of Nuisances for the Rugby Urban Sanitary District, vice Mercer, resigned.

RAWSON, William Fell, L.R.C.P. Edin., L.R.C.S. Edin. and L.M., L.S.A. Lond., has been re-appointed Medical Officer of Health for the North Bierley Urban Sanitary District: 70*l.* per ann.

ROBERTSON, James Davison, M.D. Univ. Edin., L.R.C.S. Edin., has been re-appointed Medical Officer of Health for the Penrith Urban Sanitary District: 75*l.* per ann.

SHORLAND, Edward Peter, M.R.C.S. Eng., L.S.A. Lond., has been appointed Certifying Factory Surgeon for Westbury, vice George Shorland, M.R.C.S. Eng., L.S.A. Lond., deceased.

STEDMAN, Frederick, M.R.C.S. Eng., L.S.A. Lond., has been appointed Certifying Factory Surgeon for Castleton, Derbyshire, vice Haslewood.

THOMAS, Mr. John, has been appointed Clerk to the Brynmawr Urban Sanitary Authority.

VACANCIES.

ACCRINGTON URBAN SANITARY DISTRICT. Medical Officer of Health: 100*l.* per ann. Application, 30th instant, to Edmund Whittaker, Clerk to the Authority.

BRENTFORD URBAN SANITARY DISTRICT. Surveyor: 120*l.* per ann. Application, November 1, to Stephen Woodbridge, Clerk to the Authority.

DORCHESTER. Surveyor to the Corporation and Urban Sanitary Authority.

NEWINGTON, YORKSHIRE, URBAN SANITARY DISTRICT. Surveyor, Inspector of Nuisances and Collector: 125*l.* per annum to commence with. Application, November 10, to C. J. Todd, Clerk to the Authority, Bowlalley Lane, Hull.

NORTHAMPTON URBAN SANITARY DISTRICT. Inspector of Nuisances: 100*l.* for one year. Application, November 3, to the Town Clerk.

RAMSBOTTOM URBAN SANITARY DISTRICT. Clerk, Surveyor, and Collector. Application, November 3, to the Chairman of the Authority.

SEVENOAKS URBAN SANITARY DISTRICT. Surveyor: 150*l.* per ann. Application, previous to November 1, to G. F. Carnell, Clerk to the Authority.

SANITARY PATENTS.

3093. Improvements in lamps for the burning of petroleum and other oils and liquids. William Dalton, Cranfield Road, Brockley, Kent.

3097. Improvements in apparatus for warming and ventilating railway carriages. Edward Brown, Aston, Birmingham.

3157. Certain improvements in water-closets. John Grave, Manchester.

3179. Improvements in apparatus for purifying illuminating gas. William Lloyd Wise, Chandos Chambers, Adelphi, London. A communication from Peter Sweney, New York, U.S.

3247. Improvements in water meters or apparatus for measuring the flow of liquids or fluids. Francis George Fleury, Bristol.

3327. Improvements in the construction of dry ash closets. Jeremiah Francis Seddon and Christopher Ellis, Bolton, Lancashire.

1672. Deleterious gases. Joseph Whitley, Roundhay, near Leeds.

2046. Treating foul or noxious gases, etc. William Robert Lake, Southampton Buildings, London. A communication from James Turner.

ABSTRACTS OF SPECIFICATIONS.

326. Carbonaceous material for filtering, deodorising, &c. R. Weare and S. Isherwood, Manchester.

The features of novelty in this invention consist in the production of an improved carbonaceous material by mixing clay with sawdust, clinkers, and refuse from furnaces, together with tanner's waste or the nuts used by tanners, and charring the mixture in an apparatus consisting of three, five, seven, or more cylinders revolving in or over a furnace, and arranged in the case, say of three, with two small upper cylinders and one large lower cylinder. The material is fed into the top cylinder, and after being partially carbonised passes through suitable hoppers to the lower one, all the extremities of these cylinders being fitted with covers to obtain ready access to the interior.

360. Filters. C. Lambert, Hull.

The apparatus consists of an outer casing attached to the wall of the building, within which is an inner vessel into which the water is led.

362. Ventilators. J. Hill and J. E. Hey, Halifax.

This invention relates more particularly to that class of ventilator known as 'Watson's syphon ventilator,' in which diaphragm or diaphragms are employed for separating the 'shaft' and conical or other top part or hood into two parts, one for the egress of foul air, and the other for admitting a supply of pure fresh air; but it is also applicable to 'single-tube' ventilators. The object of the improvements is to so construct the 'cowl' or head of the ventilator that down draught resulting from the force of wind acting on the ventilator may be avoided or reduced to a minimum, and the fresh air regularly introduced without reducing the ventilating capacity of the shaft of the ventilator, and dispensing with the use of a shield or deflecting plate suspended under the mouth of the ventilator below the ceiling, which besides interfering with the efficacy of the ventilator, is unsightly in appearance.

365. Stove or Fireplaces. J. Doulton, High Street, Lambeth.

The provisional specification describes dividing the ordinary chimney recess into which the stove or firegrate is fixed by two vertical partitions into three chambers. The two outer chambers are closed in at the front, the centre chamber is open at the top to the chimney, and is closed in at the front to within about twelve inches of the hearth upon which the fire is lighted. A damper is introduced, below which are side openings into flues, which are led downwards in the two side chambers, and then upwards to enter the chimney above the damper. Air is admitted to the said chambers, and after being warmed, escapes into the room. Close stoves may also be constructed with ascending and descending flues within the casing, to which fresh air may be admitted, and then allowed to escape to the room.

OPEN CONTRACTS FOR SANITARY WORK.

Borough of Sheffield. The Highway Coommittee of the Council invite tenders for the construction of nearly a mile of egg-shaped sewer (4ft. 6in. by 3ft.), with necessary man-holes, gullies, etc. The drawings, specifications, etc. may be seen, and full information obtained, on application at the office of P. B. Coghlan, C.E., Borough Surveyor, Bower Spring, Sheffield, on and after Wednesday, October 27. Lithographed copies of specification, form of tender, etc., may be had on payment of *2l.*, which sum will be returned on receipt of a *bonâ fide* tender. Sealed tenders to be sent in to the Chairman of the Highway Committee, Bower Spring, Sheffield, and endorsed 'Tenders for Ecclesall Road Sewer,' not later than Wednesday, November 10, 1875. The lowest tender not necessarily accepted.

Clayton Water Works, November 9. For the construction of reservoir to hold about 3,000,000 gallons, with valve-pit, meter-house, boundary-walls, etc. Mr. J. Limsley, C.E., 14, Kirkgate, Bradford.

Exmouth, November 3. For removing portion of the gun-point sewer, and rebuilding with concrete blocks, brick, and stone. Mr. H. C. Adams, clerk to the Local Board, Exmouth.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer—not necessarily for publication.

ALLENDALE'S letter will be published next week.

Dr. Mackintosh's letter will appear in next week's issue.

The concluding portion of the Sanitary Exhibits at the Social Science Congress at Brighton will appear next week.

Y. S. A. may, we think, safely indulge his *penchant* for Australian meat. We have never, in any instance, heard of its being other than perfectly wholesome.

X.L.—We do not advise any one to rely on the purity of well or pump (or brook) water, unless he knows that it has been proved to be pure by analysis..

Mr. Y. Courtenay is advised to communicate with Mr. Bailey Denton, Whitehall, or Mr. Eassie, C.E., Hendon; the former is the leading authority on drainage works, and the latter on domestic or house-sanitation.

ANALYSIS OF DRINKING-WATER.

IN reply to several correspondents we beg leave to state that the fee for a water-analysis is two guineas.

SIN AND DIARRHŒA.

THE Wednesfield Local Board, the *Lancet* says, have been perplexing themselves with the knotty question of the significance of epidemic diarrhœa. The ordinary views as to its relation to bad water, faulty drainage, and the like, found some supporters. Mr. Wadley—described as a stout, robust gentleman—could not understand all the fuss made now-a-days about the water question. Mr. Cooper cut the knot. He said that sin had brought disease into the world, and the Almighty permitted the outbreak of diarrhœa in their midst; neither doctors nor any one else could prevent it. Mr. Cooper is not far wrong. Sin has much to do with diarrhœa, especially municipal sin, which permits a population to drink sewage, and then coolly satisfies itself with referring the judgment to the Almighty.

RAT-EATERS.

A SOCIETY has recently been formed at Gembloux, in Belgium, of rat-eaters (*rato-phages*). The members meet once a week: each meeting ends with a grand repast, in which the rat occupies the principal place. This society, following the example of the *Société Hippophagique*, wishes to destroy the prejudice attaching to the flesh of these little animals. With this object, a Belgian *savant* relates that the ancient Romans ate grey mice, seasoned with acorns and chestnuts. Buffon tells us that the inhabitants of Martinique take pleasure in eating mice, and hold the musk-rat in esteem as an article of diet. Climbing rats form one of the staples of food in Cuba and Jamaica. Rat's flesh, however, counts its enemies as well as its friends. A medical Arab writer, Eby-Bacthar, declared that eating rat's flesh produced great *intellectual weakness*.

THE 'BLACK ASSIZE.'

THE Clerk of the Peace at Oxford (Mr. Davenport) has just placed a marble tablet at the outer entrance to the County Hall of that city, to commemorate a sad event which occurred 300 years ago. The inscription on the tablet is as follows:—'Near this spot stood the ancient County Hall, unhappily famous in history as the scene in July, 1575, of the Black Assize, when a malignant disease, known as the gaol fever, caused the death within forty days of the Lord Chief Baron (Sir Robert Bell), the High Sheriff (Sir Robert Doyley, of Menton), and about 300 more. The malady from the stench of the prisoners developed itself during the trial of one Robert Jenks, a "saucy, foul-mouthed bookseller, for scandalous words uttered against the Queen." This tablet was placed here in 1875, exactly 300 years after the event which it records.'

THE SEWAGE OF BRADFORD.

THE whole of the sewage of Bradford is now being defecated at the works at Bolton, by the lime process, introduced by Mr. Alsing, C.E. The sewage is mixed with pulverised lime in the proportion of one ton of the latter to a million gallons of the former, and the liquid sewage is then run off and filtered through coke. It has been ascertained that the annual cost will not exceed 1,000*l.* a year for every million gallons that flows daily through the sewers. That is to say, there are about 8,000,000 gallons a day of sewage, and the cost of treating that quantity for a year will be about 8,000*l.* per annum. It will be remembered that the works were built by the corporation for a company who thought that they could purify the sewage for nothing, and make a profit out of it. They failed financially, and the works were left on the hands of the corporation, who were threatened every day with heavy penalties for continuing to pollute the Bradford Beck. Mr. Alsing's process has no pretensions to novelty, but it has afforded the corporation the means of utilising the old works and ridding the town of its sewage at a reasonable cost.

THE POWER OF PLANTS TO PRODUCE OZONE.

IN addition to the pleasure that may be derived from floriculture, the sanitary value of flowers and plants is a feature of the subject so important as to call for special mention. One of the most important of the late discoveries in chemistry is that made by Professor Mantogazza, of Pavia, to the effect that ozone is generated in immense quantities by all plants and flowers possessing green leaves and aromatic odours. Hyacinths, mignonette, heliotrope, lemon, mint, lavender, narcissus, cherry-laurel, and the like, all throw off ozone largely on exposure to the sun's rays; and so powerful is this great atmospheric purifier, that it is the belief of chemists that whole districts can be redeemed from the deadly malaria which infests them, by simply covering them with aromatic vegetation. The bearing of this upon flower culture in our large cities is also very important. Experiments have proved that the air of cities contains less ozone than that of the surrounding country, and the thickly inhabited parts of cities less than the more sparsely built, or than the parks and open squares. Plants, and flowers, and green trees can alone restore the balance; so that every little flower-pot is not merely a thing of beauty, while it lasts, but has a direct and beneficial influence upon the health of the neighbourhood in which it is found.

THE EFFECTS OF HIGH ALTITUDES.

REPEATED observations have proved the altitude at which breathing begins to be difficult, and it may be fixed at 20,000 ft. In the lofty mountains of the Andes it is known that even the hardiest mountaineers, accustomed from infancy to breathe the light air of the Puna, cannot walk ten paces after attaining the height of 16,000 ft. without resting several minutes after each effort. Humboldt, at the far inferior height of 13,800, was suddenly seized with giddiness and nausea, and fell down senseless upon the ground. Bouguer, Condamine, Montufar, and other explorers, have suffered from alarming hæmorrhages at altitudes of 15,000 ft. and 17,000 ft. In the highlands of Quito it is very difficult to make the horses and mules advance at a height above 13,000 ft. They stand still, tremble all over, and fall upon the ground, and if not allowed to rest they invariably perish. Hall climbed the Chimborazo to an elevation of about 19,000 ft., but was then obliged to desist without having reached its summit, while Major Lloyd, struggling up the Boorendo peak, 19,500 ft. high, against debility and mental dejection, although he quite outdid the native villagers, was for a long time unable to take a dozen steps without exhaustion, and latterly could scarcely move at all. The same traveller testifies to the 'most dreadful symptoms,' felt in crossing some of the Indian mountain passes of less altitude. In balloons, where the necessity of active exertion does not exist, and the progress is much more speedy as well as less laborious, a height of about 23,000 ft. had thrice been attained before the year 1862. In that year Mr. Glaisher was able to make observations up to a height of 19,000 ft., although his companion, who was occupied in managing the balloon, had breathed with difficulty for some time, and was then panting for breath. At 29,000 ft. Mr. Glaisher's eyesight failed, although his sense of hearing and other mental faculties were retained a little longer. The muscular powers were, however, quite gone, and Mr. Coxwell, whose vitality must have been as extraordinary as that of M. Tissandier, was numbed and partly paralysed by the frost.

EARTH TO EARTH.—The superiority of the London Necropolis (Woking Cemetery) has been specially recognised in the *Times*, and other leading journals, and it is admitted that here only can the burial of the dead be properly carried out. The Company is prepared to conduct Funerals without the intervention of the ordinary undertaker at any stage of the proceedings. Prospectus free.—Office, 2 Lancaster Place, Strand, W.C.

NOTICE.

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Original Papers.

VILLAGE SANITATION: RURAL DRAINAGE AND HABITATIONS.

BY J. A. DAVENPORT,

Inspector and Surveyor.

IT is only quite recently that rural drainage has met with any degree of consideration. Means for the disposal of waste matters at country dwellings have hitherto seemed to concern the builders thereof but little, and it is most frequently found that the occupiers having dug out a hole (often placed very near to one of the doors) for all waste and foul matters to 'merge in,' every requirement was supposed to be met. Periodical cleansings enlarge these places, until often they may be found huge and abominable, polluting the soil and atmosphere around to a serious extent. These 'mergins,' or else, perhaps, cesspools, which are often little better than mergins in disguise, will represent, at all events in the county of Chester, the method adopted at nearly three-fourths of the houses in the rural parts for dealing with their waste matters; yet it must be confessed that they are at times less objectionable by their position than at others.

Where drains are laid they are generally of small size, often badly executed, common pipes being principally used, and from their habit of becoming choked, are frequently a source of annoyance and trouble. The rippling stream or the road drain (perhaps leading thereto), the adjoining ditch (stagnant and foul), or the mergin or cesspool, are generally the final places of deposit for these drains. Liquid manure tanks at some of the farms may be seen; but as a rule the application of the contents to the land is getting out of favour, and they are becoming disused, and in these cases, and where the sewage is otherwise arranged to be dealt with on the land, it is by no means unusual to hear the complaint of the liquid bringing more nettles and thistles than anything else; and indeed, it is no uncommon thing to find drains dribbling forth their contents on to the land, saturating and rotting the grass around their mouths, or else making it so rank that nothing will eat it. Greater attention would no doubt do something to remedy all this; but under any circumstances, the irregular flow of sewage on to land where there are only small quantities to deal with, has been really a difficulty.

Now and again it is pleasant to find a well drained house, or the cottager so careful of his waste liquids, that he makes use of them upon his garden; but still my experience goes to prove that rural drainage, as a rule, is bad; but that in the open country circumstances are favourable to the mitigation of evil effects therefrom.

The passing of the Public Health Act of 1872 has drawn considerable attention to these matters, and great good will no doubt ultimately result. In places whose importance demands from a sanitary authority the carrying out of a proper system of drainage under the direction of a competent man, a good permanent result will be at once achieved; but the result in our smaller villages and scattered places, where nuisances abound and notice has to be served for their abatement and for the prevention of their recurrence, will I fear, in many cases, hardly be so satisfactory, and the explanation of this may be found, either in the ignorance, want of means, want of inclination, penuriousness, or spirit of false economy under which the work is undertaken.

I have seen men set to work in some of these country drainage cases, who practically knew as much about it as they did of the Pyramids of Egypt. A notice is served and the shoemaker abandons his last, the tailor his sleeveboard, and they convert themselves, or are converted, for the nonce, into drainers, bricklayers, or any other kind of tradesmen, in order that the 'notice' may be got rid of at the least possible expense. Owners very often thus set their tenants to work; a shuffle of the cards is one not unfrequent result, one nasty state of things being replaced by what will ere long become another; I have seen an amateur bricklayer puzzling because his corners would not come square. I have seen drains laid that stopped up in a month, and then the pipes were found to be something like the waves of the sea; a cesspool or a drain arranged to be put down in one place, but the owner having been, like the elder Mr. Weller, to consult some sapient member of his craft, you find it actually placed just where you would have never consented that it should have been; and cases of a similar nature might be multiplied. The good permanent work done in obedience to 'notices of nuisance' will, I fear, hardly bear comparison with that which is more or less inefficient, which will require continual inspection, *i.e.* trouble to the sanitary officers and annoyance to the parties interested, which, probably, might easily have been better, and which as it is, will most likely have ultimately to be done over again. It is true that the Sanitary Authority have power in certain cases to direct what drainage shall be done or to execute it, but this will not apply to the vast number of instances in the country where a very little pressure is sufficient to set the owners or occupiers in motion. There is, however, another phase of the question. Be the expenditure in structural works little or much, and be the result satisfactory or otherwise, I have observed that a rise in rent is one not unfrequent result. Now if a certain expenditure is incurred and permanent good follows, the addition of a fair percentage to the rent might not be complained of; but a heavy addition to the rent for very temporary measures of sanitary reform is a very different thing, and, at all events, it may be considered only reasonable that if an enhanced rent is asked, there should be a corresponding permanent benefit.

In the interests, therefore, not only of public health, but of all parties concerned, it may be worth while to consider if some better system of dealing with these questions may not be pointed out.

I would venture to suggest, then, that it should be the Sanitary Authority's duty to devise and carry out all drainage works wherever required, be they great or small, and the same, indeed, might apply to works of water-supply; but inasmuch as the views upon drainage matters, even amongst acknowledged authorities, are very diverse, it would be useful, if the Central Department in London (especially looking at the money question and the control under such a system that they might necessarily be expected to exercise) would lay down some 'rules for guidance.' It would, of course, be impossible that every little scheme of drainage should directly receive their sanction or that they could make suggestions to meet every case that might arise; still, I think, prin-

ciples might be laid down, the result of the matured wisdom of the highest medical and engineering talent of the day, and upon which, if house drainage or small schemes were executed, they would be considered satisfactory. Something of this kind would, probably, be more likely to command the confidence of owners themselves, as they would feel that the best that could be done would be done, and the matter finally disposed of.

Inspectors of nuisances would, of course, require to be surveyors in every case, and each would require to be aided by a good practical foreman drainer, who, when not otherwise occupied, might act as assistant inspector. The latter would be the only additional permanent officer, and his salary to a great extent might be paid by a charge for the services rendered.

Intricate questions in connection with rural drainage are continually arising. It is often impossible properly to deal with it, without interfering with adjoining rights, as to which (where necessary) Sanitary Authorities should have full powers, and all such matters require much careful handling.

The next question is the financial one. I am aware that it would be objectionable to have a multiplicity of small rating areas; and perhaps the best method of meeting this difficulty would be to borrow the money for a term of years on the rates of the township, charging property benefited upon the full rateable value, and dealing with all other property as land is now dealt with under the present rating system, *i.e.* charging it upon a fractional proportion of its rateable value. Land is now charged at one fourth, and this or some other fractional proportion might be considered fair.

Should, however, the general rating of property for drainage at private houses be considered to touch upon a principle that has been long established, *i.e.* that property should only be rated generally for works of a public nature, this suggested principle of rating might be applied only where sewers are required to be constructed for the purpose of draining property of some considerable extent, and where the work might be said to be in the nature of a benefit to the whole township. The drainage of single houses or small blocks might then be made chargeable on the owners thereof, or the property might be separately rated for the charge as might be agreed. This would involve some extra trouble as to accounts, but in the opinion that difficulties under this head would not be excessive I am confirmed by persons competent to judge.

Work then, executed as suggested upon the best known principles, by skilled men, would, I venture to think, be in the end cheaper for landlords, and really in many cases a protection to them as well as to tenants. Questions of want of means would not arise, sanitary officers' duties would in the future be much lightened, and a gain would result to the public health. Of the systems of dealing with house-slops and liquid refuse, one that seems to answer in the district with which I am connected is that of subirrigation carried out either in the gardens or fields adjacent to the dwellings, sometimes in connection with a little tank and sometimes without; where there is no tank the slops are thrown to a trapped grid, below which there is a strainer to prevent any matter from passing likely to choke the drain. Where it is necessary to prevent pollution of the soil, sanitary pipes should be used and the joints made watertight, but where the liquid is dealt with, common pipes are used (sometimes with collars), and at every two or three feet spur pipes branch out for three or four pipes' length; these drains are placed ten or twelve inches below the surface, and the liquid soaks from them into the soil. It is necessary, however, to provide subsoil drains at as great a depth as possible in order to relieve the soil of the excess of purified water; sometimes it is preferred to allow the waste liquid to drain into a little tank first, properly placed, covered, and ventilated, to be kept for garden purposes (for which it is most valuable), and then the overflow only is dealt with on the above system. Sometimes I have utilised a deep ditch, running the overflow irrigating drain parallel to it, and allowing the liquid to filter through the intervening soil. If the upper drains should become choked, it would be but a small matter to take them up and relay them; but I have in my district a block of eight or ten houses (belonging to Mr. Owen Lunt of Nantwich) that have been drained on this system for two years past, and all is working well up to the present time, with no signs of choking. Most of this class of work is roughly done, and under conditions rendering a good result a matter of some doubt, still so far it is as satisfactory as might be expected. A considerable number of houses in this district are drained upon this system, but I mention Mr. Lunt's houses as being the first that were dealt with and which have therefore stood the longest test. The difficulties in persuading and arranging as to this particular system have been great, for ordinary people do not quite comprehend it. Many 'heads have been shaken' over it, and some of the attempts at carrying it out would be amusing to relate. The only principle that I have considered it safe to act upon is to deal with all foul liquids by the soil; get them properly on to it or through it as quickly as possible, and in suggesting any rural drainage I have always kept this end in view. The system sketched out, or some little variation of it, which will frequently be necessary, looking at the varying conditions under which such work has to be carried out will, I venture to think, generally in the country be found to furnish a fair solution of the difficulty. The ventilation of the drains should in all cases be insisted upon, and any direct communication from the dwelling into them prohibited. Field's Flush Tank would be a great addition to any system of garden sub-irrigation, as by means of the syphon the accumulated supply is discharged with a sudden flush, the tendency in the drains to choke is lessened, and the liquid at once distributed over a proper area of ground. The cost of this tank is now so small that it cannot really form any objection to it, but the objection to 'any expense' is generally so great that it is not as commonly to be seen in use as might be desired. It is valuable, however, and I have no doubt will become more extensively used. Greater difficulties with these sub-irrigating systems will be experienced where the soil is excessively stiff, but the ashes from the house, and the refuse from the garden, burnt, together with other substances tending to lighten it, being mixed therewith will, in some degree, tend to remove the difficulty. I have sub-irrigating drains in gardens in my district where the soil is heavy, and they are at present working well. Probably for villages, etc., no better method of dealing with their sewage could be adopted than that provided by the automatic sewage meter tank. It has been mentioned before that the irregular flow of sewage on to land (at times a mere

dribble, and at other times flowing more copiously), has been a difficulty in its successful application. The 'Automatic Sewage Tank' meets this difficulty. By this means the flow of sewage from the tank may be regulated, it being not at all dependent upon the flow into it. The sewage being piped into the tank in the ordinary way, it is discharged by means of a syphon which acts automatically when the liquid sewage in the tank has risen to a given level. The contents, however slowly collected, are thus discharged all at once, and can be applied to a properly proportioned area of land prepared to receive it, and intermittency of application is secured. The sewage is properly strained prior to passing into the principal tank, and can, when discharged by the syphon, be delivered on to the land, to be dealt with either by irrigation or intermittent filtration.

From London to Leatherhead by rail,—a delightful walk thence brings one to the little village of Eastwick, the drainage of which is dealt with on this system; the tank here holds 500 gallons, discharging itself in dry weather three times in two days, and receives the slops, etc. from thirteen houses, including farm and mansion, representing a population of about 145. The sewage is utilised upon a trifle more than three-fourths of an acre of land. The cost of the works, some 320*l.*, may look, in the first instance large, but it is calculated that a return of 17*l.*, or something like 5 per cent. upon the capital, is obtained from the sewaged land. I was much pleased with my visit here. There was an absence of nuisance about the houses, good drainage, and certainly the best method of ultimately disposing of village sewage that I had seen. Before adopting any system of dealing with small quantities of sewage I would advise any one interested to go and see for themselves the drainage arrangements at the little village of Eastwick.

In conclusion, I would briefly refer to a class of habitations which it has often been my duty to report upon, and similar reports from other rural districts may be found recorded; I mean the small dilapidated and over-crowded one-bedroomed cottages, in which hale and sick, living and dead, have at times to find accommodation side by side. Even if it be comparatively easy to get these places pulled down it is not so easy to replace them with better. The fact is, that as an investment, cottage property is not generally liked. A large landed proprietor who has built more excellent cottages than any one I know, has told me that for money expended they do not pay at all. Unless, therefore, the necessities of an estate require it, it is not to be expected that landowners will, as a matter of course, furnish cottages which may be required. If speculators supply the want, sanitary considerations will be made secondary to the question of what will pay. To say that the inferior class of habitations referred to are general would not be right, but they are common enough to form a difficulty, and if families are removed from them it is not unusual to find them again occupying houses of a similar class. 'A poor fellow,' with a large family, where houses are scarce, is thus liable to be hunted from pillar to post. This is unfortunate, but it is equally unfortunate that a sanitary authority should have to tolerate a state of affairs which is clearly against the law, and which they do not see their way to remedy. Where then does the responsibility lie, and what can be done? Landowners could hardly be compelled to spend money, that for various reasons they might be disinclined to, and it is quite clear that the persecution of the occupants of these places will not improve the dwellings they inhabit. The solution is difficult, no doubt, but is it not a part of that large question which is also awaiting solution in our large towns, and in the endeavour to remedy which, the Government have proposed special legislation in their Artisans' and Labourers' Dwellings Act? It is right, no doubt, to commence in our more populous centres first, but there is little hope, I fear, of the rural difficulties of this nature being fairly met, without Government intervention of some kind. That the difficulties alluded to will ultimately be so met is, I think, pretty certain, but the sooner the time comes the better it will be for real sanitary progress.

Besides the habitations complained of on the land, it will happen often enough in rural districts that similar or even worse may be complained of as moving along their navigable waters; I refer to the canals and the boats which ply upon them, in which whole families are too often huddled together in space that would be called anything but luxurious for pigs. Three-fourths of what are termed the 'slow-boats' on the canals I have more immediately to do with contain families of goodly numbers. Frequently five or six, I have known as many as twelve, all stowed in cabins, with less than 300 cubic feet of air-space. They have no other homes, and when infectious disease breaks out, what opportunities there are for the spread of disease as the boat passes on its journey may be readily conceived. Continually on the move, they are practically as independent of the Sanitary Acts as they are of the Educational Acts. As a class, it is evident boatmen have been almost forgotten, and it is to be hoped that the inquiry now being made into their condition under the Factory Acts Commission will result in their being brought more directly under educational as well as sanitary supervision. Sanitary authorities as guardians of the public health have most important duties to perform, and it is only reasonable that the means at their disposal for properly carrying out sanitary requirements should be as plain and straightforward as possible, which in many cases at present they are not.

True, we may be undergoing an educational process in sanitary matters at the present time, and rural sanitation may be comparatively a new thing, but at the same time the discussion of difficulties that are found in practice to arise and any suggestions as to dealing with them, will hasten in some little degree, I trust, the time, when more thorough satisfaction can be felt that our way is made clearer to solve the different sanitary problems in connection with our rural districts, and to reach forth to that sanitary standard of perfection that all deeply interested in the subject feel it so desirable to attain unto.

EXHIBITS AT THE SOCIAL SCIENCE CONGRESS, BRIGHTON.

THE Sanitary and Economic Manure Company, of Factory Lane, Salford, exhibit a very excellent ash-closet, which is both economical in use and automatic in action. The deodorising material is sifted ash-dust; the unscreened cinders being placed in a hopper in the upper part of the apparatus, which is sufficiently agitated every time the closet is used to sprinkle a sufficient quantity of

finely-sifted ash-dust to defecate the soil and absorb the moisture and no more. The same action which ensues from using the closet screens also the valuable cinders from the fine ashes, and therefore serves the double duty of economising both fuel and manure in an inoffensive manner. These closets are made in various sizes and prices, and in towns and places where the dry earth system is impracticable these cinder closets would be invaluable.

THE PATENT SELENIC CEMENT COMPANY, of Millbank Street, Westminster, have, by means of their new cement, obviated the difficulties and great annoyances which are incidental to the use of mortar, however carefully it may have been prepared. Their selenic cement possesses the following advantages :—It sets readily and quickly, and in this manner effects a saving of nearly three-fourths of the time which is usually required to set ordinary lime; for bricklaying purposes the patent cement possesses great tensile strength, which does not impair by time; and, from the rapidity with which it sets, buildings can be built in much less time than is taken in the ordinary way. These are great advantages, as they will ensure both a greater amount of safety and freedom from damp than has been attainable by the ordinary methods at a much lower price. We believe that the cost of this material is very little in excess of common mortar. The material has been well spoken of by the *Building Journal* and large building firms, who have tested it practically, and are therefore in a position to speak positively of its merits.

MR. EUGENE RIMMEL, of 96, Strand, by means of an appliance similar to his well-known perfume-vaporiser, diffuses an aromatic disinfectant through the air. This little apparatus will be found of considerable utility in the sick room, hospitals, and other large buildings, as it combines refreshment to the invalid, with a thorough disinfection of the apartments, the latter being unquestionably a great desideratum.

MR. JOSEPH DAVIS, of 92 Crampton Street, Newington Butts, exhibits his Royal Polytechnic Barometer, which combines the whole of Admiral Fitzroy's improvements, and forms a handsome piece of furniture, apart from the value it possesses as an indicator of the coming weather, which casts its shadow before. Mr. Davis also shows an assortment of thermometers adapted for all purposes, and also lactometers and water-testing apparatus.

MESSRS. FRANCIS AND COMPANY, of 7 Southampton Street, Strand, have an excellent variety of electric bells, which for convenience and simplicity bid fair in the course of time to supersede the present cumbersome arrangement of cranks, springs, and wires which are continually getting out of order. Messrs. Francis's bells are adapted for a variety of purposes, such as thief alarms, distant communicators, house and call bells, and signals. They are exceedingly well got up.

MESSRS. W. DEANE AND SON, of Trafalgar Street, Brighton, have a large variety of cooking stoves and fuel-saving ranges, which deserve careful attention in view of the present high prices of coal and the prospective increase in the face of a coming winter which has been prognosticated as likely to be an unusually long and severe one.

They exhibit Smith and Wellstood's American cooking ranges, which are economical in use, efficient in operation, durable in construction, and simple in management. They are complete in themselves; require no brickwork setting, and are not liable to get out of order. It must be confessed that in many of these kind of inventions the Americans have far excelled us. Messrs. W. Deane also exhibit a variety of the 'Cottager' Kitchener cooking stoves, for gas or fuel; patent portable cooking stoves, constructed to burn any of the mineral oils; boiling stoves and apparatus for burning methylated spirit; improved self-acting domestic cinder sifter; portable wash-hand stand, etc.; wrought iron enamelled kitchen utensils. Those stoves and ranges which are constructed to burn mineral oils certainly are well worthy of careful consideration.

MESSRS. KAY, BROTHERS, of Lower Hill Gate, Stockport, have made a great advance by their method of utilising lava. All inventions which tend to utilise waste material deserve commendation. Messrs. Kay have so far utilised this waste material as to produce a royal coat of arms, cast in lava; a sanitary tile; sanitary trough; and a model of an acid cistern in lava. All these useful articles appear capable of receiving a high degree of finish of an artistic character.

MESSRS. PITTS AND BINNER, of the Albion Works, Stanningly, Leeds, show the action of Messrs. Ballard and Pitt's patent ventilating apparatus. Their plan is to admit air from without in a continuous stream to the interior of the buildings. In this respect the invention resembles the far-famed Tobin system, with this difference, that provision is made for the egress of the vitiated as well as the ingress of the purer air.

MESSRS. E. CETTI AND CO., of 11, Brook Street, Holborn, exhibit a large number of instruments specially adapted for medical purposes, and for use in the sick room, comprising butter and urea tests; air meters; urinometer cabinet; small urea case; male and female urinals; invalids' teapots, tumbler, and medicine glasses; small pocket hydrometer for ascertaining if the bed clothes are well aired; nest of cupping-glasses; clinical thermometer cases; lactometer tubes and stand; thermometers for bed rooms and domestic use; bath thermometers; and lactometers. All these exhibits are remarkable for the great care and finish that has been bestowed upon every detail.

MESSRS HOWARD AND SONS, of Berners Street, exhibit their patent parquet flooring. For artistic effect, cleanliness, and durability, this system of flooring deserves special praise. This parquet can be laid on all kinds of existing floors, and in every variety of artistic design, from the medieval to the renaissance. Those who have a penchant for the old waxed floors can indulge in this taste without the inconvenience and danger attendant on that method of polishing, whilst for cleanliness the parquet is unrivalled.

MR. G. H. HARRIS, of Bristol Street, Birmingham, has a patent recumbent couch adapted specially for invalids. Reading easels and library chairs, and a large variety of domestic labour-saving appliances, such as boot cleaning, brushing machines, sausage-mincers, apple-parers, cleaning steps and window cleaners, and a variety of other inventions, all having in view the comfort, convenience and safety of the household.

MR. ELIAS GEORGE WRIGHT of the Commercial Road, Portsmouth, has an ingeniously contrived machine for the sifting and mixing of poisonous powders in a safe and efficient manner. The mixer being carefully boxed in effectually prevents any poisonous dust from flying about.

MESSRS. BELL AND CO., 491 Oxford Street, exhibit a very convenient form of washing and wringing machine, suitable for small or large families. This machine works on the vertical principle, the agitator or 'dolly' being made to revolve rapidly in a circular tube. This action ensures a thorough cleansing of the linen at a moderate expenditure of force, and an even and regular motion which must be a great advantage to the worker. The inventors claim for this machine that it will do the washing of a family of eight persons in two hours. That it has gained over seventy prizes and medals is a proof of its efficiency and value. A wringing and mangling machine is also attached to the washer.

THE

SANITARY RECORD.

SATURDAY, NOVEMBER 6, 1875.

TO SECRETARIES OF SANITARY ASSOCIATIONS AND KINDRED SOCIETIES.

The Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers read before the members of any sanitary or kindred association.

FOOD ANALYSIS AND ITS ASSAILANTS.

A LITTLE knowledge is proverbially dangerous, hence the attacks upon that most useful branch of chemistry, food analysis, which have appeared from time to time in the columns of some of our contemporaries.

We can understand that a trade journal may, in mistaking the true interests of its supporters, advocate a total disbelief in the accuracy of any estimate of value or purity unless given by special buyers and dealers in their own particular trade. We know that gentlemen engaged in tea-tasting for the wholesale purchase of that article are enjoined to take the most careful precautions for the preservation of good health, to maintain an exquisite discrimination of flavour; and to remunerate them for the hardship of leading the sober, healthy existence necessary for the empirical valuation of tea by tasting, incomes equal to those of our best-paid magistrates are freely accorded.

When a doubt was cast upon the ability of the analysts to determine the amount of the addition, if any, of exhausted tea-leaves, it was proved, beyond doubt, that less than 5 per cent. of such addition could be detected by a scientific analysis (tea-assay). On the other hand, several samples of tea containing various weighed proportions of exhausted leaves, together with some of the same tea, just as taken from the original chest, were sealed up and submitted to the best judges in the trade. Their verdict gave a higher value to samples containing from 10 to 15 per cent. of spent leaves than to the unadulterated tea.

In this instance, as in many others, the facts of the case would not bear argument, so the analysts have been accused of a multiplicity of social crimes, under the cloud of which the true significance of their good work is attempted to be obscured.

Ignorance, venality, and, forsooth, a determined animus against the 'harassed trader' is assumed as characteristic of anyone who seeks to ascertain the purity or genuineness of food.

The favourite denouncement hurled at the poor public analyst is that *he* is the prosecutor of, the informer against, and the spy upon the recalcitrant shopkeeper. That the analyst is always lying in wait to injure honest reputations; and, among his other machinations, the scaring of the more timorous of the public by over-coloured and exaggerated statements of the impurities and disgusting additions found in our daily food is roundly asserted to be one of his most effective weapons.

All this may be very well for the consistent advocates of *caveat emptor*, but it might be thought that the writers of the daily journals would avoid 'high falutin' on such a theme at the expense of common sense, and to the disparagement of the subordinate officers of local boards and vestries, appointed to analyse a good many samples of milk and a few sealed packages of other foods.

As, however, the dignity of leader-writing for a prominent daily paper has not recently been found proof against the temptation to indulge in rather rough humour on these points, and the particular instances, arguments, and inferences deduced, appear to us peculiarly liable to lead up to a false issue, we take the opportunity to draw attention to a few palpable considerations which may have been overlooked.

It must, again and again, be insisted that the analysts have no greater power to order prosecutions under the Adulteration of Food Act than they possess in common with any other purchasers of samples found to be adulterated. They do not, in their public capacity, point out where the samples for analysis are to be bought, nor do they know from whence the samples come; in fact, the analyst identifies them by a number only; and, that this should be the case, is the essence of the impartiality of his certificate.

Under the new Act, if the certificate is broken

down by the greater weight of testimony brought to bear by a more eminent chemist, surely this failure in the equality of ability, perhaps, on some abstruse point, is not peculiar to the analytical profession. The judgments of many of our best Vice-Chancellors have been reversed upon appeal, and again maintained by the Lords Chancellors. Analytical jurisprudence, like medical jurisprudence, is not infallible, but a contested probate, a running-down case, or a disputed valuation under a railway bill, will each present far greater anomalies, contradictions of evidence, and inequality of judgment, than has yet been shown consequent upon the working of either of the Adulteration of Food Acts.

We cannot think it objectionable that the most extended publicity should be given to the detection of unsuspected impurity or adulteration of food when the facts are well ascertained. Compared with the morbid appetite for minute details of a sensational murder stimulated by piquant reporting, the warning afforded, through the medium of the press, against the injurious contamination of milk, water from the cistern or from the syphon, or, indeed, of any important article of food, is of a true public value which may not be so vividly apparent to the instinct of *littérateurs* of the ecstatic or spasmodic Rabelaisian school. As these in question are some of the instances in which injurious contaminations are supposed to have been overrated, we can only advert to proved facts of the widest import, and state our conviction that in them there is, at least, no joke to the possible consumers.

Very unpleasant facts are officially recorded by Dr. Ballard with respect to the dissemination of typhoid fever through the contamination of milk at Armley. The same disease was certified by Dr. Britton to have attacked thirty persons at Brighouse in Yorkshire, twenty-nine of whom had been supplied with milk from the same farm-house; and, most notorious of the many other instances, the fearful epidemic of 1873 in Marylebone was traced out, by Dr. Murchison and others, to have been caused entirely by the agency of polluted milk, and repeated outbreaks of a similar character have since been traced to the same cause. Will any sneer wipe from the memory of the bereaved the lasting sting that the lives sacrificed might have been saved, if the publicity accorded *after* the events had been forthcoming, so as to antedate by a year or so the certainty of obtaining milk guaranteed to be free from pollution?

Will the public rest satisfied with common leaden cisterns and pipes for their water-supply, when it is known that at certain seasons of the year, notably, autumn, the water of large districts surrounding London becomes impregnated with certain salts which cause it to dissolve lead and hold it in poisonous solution? One-third of Louis Philippe's family were struck down by the accumulation of lead in the system from this cause, and analysis proves that in many unsuspected instances minute quantities of lead in water produce saturnine paralysis or the complicated train of disorders preceding this unmistakable result. Can a gibe in a newspaper article remove the one-and-a-half tenths of a grain per gallon of lead in solution found by a London chemist in the soda-water, lemonade, and ginger-beer of one of the principal makers of such beverages? This is more than double the quantity of poison which prostrated the family of Louis Philippe, and the use of natural waters of certified purity may be consistently advocated as a more reliable means of avoiding such dangers than by pooh-poohing them, or the certain evidence afforded of their existence by analysis.

Notes of the Week.

THE Birmingham School Board have decided to add instruction in cookery to the curriculum of their schools for girls.

THE ventilation of sewers by connecting them with the chimney stalks of factories and public buildings, has been tried in Greenock, and, it is stated, with successful results.

THE mortality of Glasgow has now remained for a month at the low rate of twenty-one. It is stated that there is no record of so long a continuance of such a low death-rate in that city.

COMMODORE HOSKINS has received instructions from the Admiralty to report on a new system of packing biscuit in tins, by which means it is anticipated it will be preserved from deterioration, and be more palatable.

PERMISSION to use salt, for the purpose of melting snow upon the roadways, was granted, at a meeting of the St. Pancras Vestry on Oct. 29, to the General Omnibus Company, by a majority of twenty-eight.

AT a meeting of the Birmingham Town Council on October 27, 1,000*l.* were voted to be expended in planting trees in different parts of the city, and protecting them with guards round the stems and grating over the roots.

AT a special meeting of the corporation of Dublin, held on the 27th ult., the draft of a bill intended to amend the Dublin Main Drainage Act, was brought forward, and it was determined that the necessary steps should be taken for bringing forward the bill in the ensuing session.

THE Floating Baths Company have fitted their bath on the Thames at Charing Cross with a heating apparatus, by which the temperature is regularly raised to about eighty degrees Fahrenheit, so that swimmers can continue their exercise throughout the winter.

THE Edinburgh Improvement Trustees have expended, among other items, a sum of 42,753*l.* in old properties acquired with a view to removal, and the expenses in connection with the purchases, 1,404*l.* in the removal of old buildings, 299*l.* for disposal of building areas, and 6,342*l.* for forming roadways and drains.

AT the Brighton meeting of the Social Science Association a resolution was passed requesting the council to communicate with the authorities of the Science and Art Department of the Privy Council, suggesting the desirableness of making 'Foods, their uses and preparation,' the subject of examination.

TYPHOID FEVER ON BOARD THE *CORNWALL* TRAINING-SHIP.

A FEW more cases of typhoid have occurred during the week on board the *Cornwall*, making, we believe, a total of eighty-nine out of 235 boys in the ship. The virulence of the outbreak has greatly diminished, and hopes are entertained that it will speedily be brought under control.

GREAT NUISANCES.

A CRITICAL observer, writing from Munich in the *Boston Medical and Surgical Journal*, describes the enormous abbatoir at La Villette, near Paris, as being 'next to the Liernur system in Amsterdam and the rivers Liffey and Clyde, the greatest nuisances which I have seen on this side of the Atlantic.'

A SANITARY APPOINTMENT.

THE St. Giles's Board of Works have, we understand, elected as medical officer of health, in the place of the late Dr. Ross, a member of their own board. As there were upwards of thirty candidates, many of whom possessed far higher credentials for the post, such an appointment is likely to give rise to just and severe animadversions.

A TRANSITION CONDITION.

PROFESSOR PETTENKOFER, of Munich, after twenty-five years of study of typhoid fever at Munich, seems to have got himself into a perfect state of confusion. He is utterly in the dark as to the nature of the typhoid poison. He is only sure of one thing, that drinking water had 'damit gar nichts zu thun.' It is quite possible that he may live to arrive at the conclusion that the only thing of which he is certain is the one thing which is doubtful.

LIVERPOOL AND THE ARTISANS' DWELLINGS ACT.

THE promptness which the large centres of civilisation have shown in adopting the Artisans' Dwellings Act is a very gratifying sign of their eagerness for sanitary improvements. We observe with pleasure that, following closely in the wake of Birmingham, the Liverpool Town Council, at their meeting on October 27, adopted a recommendation of the health committee for the immediate application of the Artisans' Dwellings Act. The scheme will include an area containing about 22,487 superficial yards, of which 3,717 are laid out as public streets, and 18,770 are covered by low class dwellings and buildings or yards in use for trade purposes. The population of the district is at present about 1,300, of which 1,100 are of the working class. Most of the dwellings are in a bad sanitary condition, many of them are in a hollow much below the level of the neighbouring houses, and the drainage is generally old and defective. In order to make the scheme efficient for sanitary purposes it is proposed to purchase or take compulsorily the whole of the property within the area in question, to remove the buildings, and fill up the hollow to a proper level for building purposes, and to secure a convenient street and uniform gradient forty-five feet wide. By a judicious arrangement of dwellings with the best sanitary conditions, a much larger number of persons can be accommodated than at present, and an important street improvement will at the same time be effected. The number of persons of the working class who may be displaced in the area in respect of which the scheme is proposed is 1,100. Provision for the accommodation of those persons in suitable dwellings situated without the limits of the same area will be made. The net cost of the improvements is over 60,000*l*.

A GARDEN IN ST. GEORGE'S-IN-THE-EAST.

THE Rev. Harry Jones has, in a letter to the *Times*, propounds a scheme for converting a long disused churchyard and the adjoining burial-ground of a Wesleyan chapel into a public garden in St. George's-in-the-East. This open space would provide an acre or more of pleasure ground, traversed by a broad path between the populous thoroughfares of Cable Street and Ratcliff Highway. The plans and estimates for this desirable improvement are all made, and the Vestry only wait for the concurrence and help of the Metropolitan Board of Works, which is asked to provide half its cost. The advantage of an open space of the kind prettily laid out and carefully tended, in the midst of a population of about 50,000 souls, who have no park or garden within convenient reach, is too obvious to require any extraneous advocacy.

THE FACING OF TEA.

THE alarming statement in the letter of October 28, from Messrs. Binyons, Robinson, and Co., of St. Ann's Square, Manchester, which was published in the *Times*, is founded in error. According to the letter in question, the colouring matter is Prussian blue, a ferrocyanide of ferricum, a member of the poison group cyanogen, which, though harmless in itself, is readily converted in the human system, by the alkaline reaction of the tea, into cyanide of potassium and prussic acid, the worst forms of the same family. The writers go on to state that this experiment has been repeatedly performed in their own laboratory, and that many competent persons can testify to the facts. Now Prussian blue yields ferrocyanides and not cyanides when treated with alkalies, and ferrocyanides are comparatively harmless. Ferrocyanide of potassium has indeed been used in large doses as a purgative.

WASTE OF COAL.

THE deteriorating effects which exposure to a damp atmosphere produces upon certain kinds of coal have been noticed frequently. It has remained, however, for M. Varrentrass to demonstrate the fact by a course of elaborate experimentation. In many cases he has found that there is a loss by the disengagement of the gases, and by slow oxidation amounting in time to one-third of the original weight in bulk. At the same time the heating power would be diminished as much as 47 per cent. Confined in a close chamber or receptacle, coal of a like kind and quantity, and imprisoned for the same period, would only lose 25 per cent. of the gases and 10 per cent. of the heating power. Bituminous coals were found to undergo deterioration in the most rapid ratio.

Such data as these, which may be relied upon as exact, teaches the necessity of having covered places for storing coals both as regards merchants and consumers. The former would gain in the saving of weight, and the latter in the heating value of the material purchased.

THE 'ROBERTS' SYSTEM OF SEWERAGE.

A NEW system of sewerage, differing in many essential respects from any at present employed, has lately been originated by Mr. G. H. Roberts, civil engineer, of Preston. Impressed with the opinion that the plan of collecting all the sewage of a town into one main sewer, which is the plan generally pursued at the present time, is attended with many disadvantages, Mr. Roberts divides the town to be sewered, into sections, and conveys the sewage into a few small tanks, placed in advantageous positions on the outskirts of the town. By dividing the sewers into short lengths, the sewage matter passes rapidly through them, has no time to decompose, soon finds its way into the tanks, and, the quantity being small, precipitation and purification by certain processes immediately take place, and it passes into the river powerless for harm. The scheme is also stated to have the advantage of being

much more economical than the present plan, costing, indeed, only one-tenth as much. Mr. Roberts is now engaged upon a plan for the drainage of Urmston, near Manchester, for the sanitary authority there, at an estimated cost of 2,000*l.*, whilst he asserts that a similar arrangement under the old system would have cost from 10,000*l.* to 50,000*l.* We hear that the whole subject is to be brought before the Manchester Conference by Lord Winmarleigh, and we shall carefully watch the progress of the system.

PESTILENCE IN THE WALLS.

WE see by the report of the proceedings of the Metropolitan Board of Works, that Dr. Tripe, the medical officer of health for Hackney, has reported to them that fine siftings of house refuse were being mixed with mortar which was being used for the erection of certain houses within his district, and for plastering the walls thereof. On making some further inquiries into the matter we are informed that a large proportion of these siftings were used because the sand was loamy, and the mortar therefore would not readily come off the trowel; but there is no doubt that this was not the chief reason, as the object was to save the expense of using sand, whilst the siftings cost nothing but labour. If the fine particles of 'coke breeze' had been used there would not have been any objection, as mortar made in that way becomes extremely hard; indeed, when mixed with the best lime and sharp sand it closely resembles the mortar made by the ancient Romans. There can be no doubt that the metropolitan district surveyors can prevent the use of mould, road-sweepings, dust-refuse, and other similar materials for mixing mortar, as an important decision by Mr. Ingham was reported in these pages on August 21 last. In this case a builder was summoned for using mortar which contained 20 per cent. of sand, and 80 per cent. of loam. Mr. Ingham inspected the building, and ordered it to be pulled down within seven days. The Metropolitan Buildings Act does not define the materials of which mortar should consist, but the bill which was withdrawn in 1873 defined it as being a compound of good lime or cement, mixed in proper proportions with sharp sand or other material, to the satisfaction of the district surveyor. We do not consider even this definition as satisfactory, because what one surveyor would consider to be 'other material fit for the purpose,' another might not, and because it might open a way for arranging with the surveyor to the detriment of the public. We trust the Building Act Committee of the Metropolitan Board of Works, to whom this matter was referred, will take such sharp action in the matter as to prevent the use of such abominable mixtures for the future.

SUBURBAN HOUSES.

A CORRESPONDENT has called our attention to a number of houses which are being built, or have been lately completed, in the north-western district of the metropolis. He complains that the houses are not provided with proper dust-bins, placed at a distance from the buildings, but are either unfit for the purpose, or placed in the front area near to the windows. That the drains are imperfectly laid, and, as the houses are usually sold as soon as built to persons with small means, 'the drains are left to take care of themselves.' As a remedy for these and similar evils, he proposes that an inspector be authorised and appointed to overlook the sanitary arrangements of every house in course of erection, or, at any rate, before occupation, and that he be dismissed in the event of disease arising from want of proper sanitary arrangements and accommodation.

Similar complaints reach us from nearly all the outskirts of London, where houses are not only built by speculative builders with bad materials and new wood, so that the doors, floors, and window-sashes shrink and admit the cold air from all parts of the room; but in some parts they are built on rubbish-shoots, and the mortar and plaster mixed with the fine siftings of the dust and refuse dug out for the foundations. These things ought not to be, but they exist from the greed of the builders; from the want of a legal definition as to the constituents of mortar, etc.; and from the division of the statutory powers to inspect and control the drainage works and building operations between the surveyors of the Metropolitan Board and of the Local Boards. What is urgently required is a new Act of Parliament prohibiting the deposit of house-refuse or other offensive material on building sites; erecting buildings in made ground, unless the whole site of the building be covered with concrete; compelling builders to enclose in concrete all drain-pipes passing under the basement or near to the walls of houses; and defining more strictly the materials themselves, and the proportions thereof, to be used in building houses, making concrete, etc. The present state of things is simply scandalous, and should be altered in the next session of Parliament. At the same time, whilst admitting the shortcomings of the law, we do not hold district surveyors, and the surveyors of the local authorities, to be by any means blameless in the matter.

SANITARY SUPERVISION OF DAIRIES.

WE published recently the details of a very sharp outbreak of typhoid fever at Jarrow, traced by Mr. Spear, the medical officer of health, to the distribution of infected milk, and promptly arrested by cutting off the supply of the poisonous milk. Dr. Russell, the medical officer of Glasgow, has recently completed the investigation of another outbreak of typhoid fever in that city, which he traces to a similar cause.

The report itself is a somewhat long document, and it may be sufficient here to state that, from a house-to-house visitation of certain streets in which the disease was prevalent, the following results were obtained. There were 367 persons using milk from the suspected dairy only (called Dairy X. in the report); and of these fifty-five had typhoid fever, and fourteen had suspicious sickness. There were 116 using this milk partially, and among them there were three cases of typhoid, and sixteen of suspicious sickness. On the other hand, there were 579 individuals not using this milk; and there was only one case of typhoid, and no case of suspicious sickness. The medical officer points out the difficult nature of the inquiry, and hints that infected milk is oftener the cause of such outbreaks than we can prove it to be. He winds up with the two following lessons, which these facts are calculated to teach.

'1. He is satisfied that, if rural authorities throughout the country made a special inspection of the sanitary arrangements of all the dairy farms, examining particularly the water-supply, and insisting on improvements in the domestic arrangements of washing-houses, the sites of manure depôts, etc., more would be done to exterminate enteric fever, both in the country and our large cities, than by any other procedure which could be adopted. 2. He is afraid that milk agents in the large cities are not sufficiently alive to the duty which is imposed upon them, as upon all dealers in articles of food, of seeing to the purity of the article which they sell; and he hints to dairy-keepers who are anxious to extend their business, that they should at once introduce a reform in this respect, and seek to satisfy themselves and their constituents that they are furnished with clean and pure milk from tidily kept farms, where no disease is known to exist. The board wisely directed that this report should be printed in a pamphlet form, and that a copy should be sent to the Board of Supervision, with a request that they should communicate with the local authorities around Glasgow, and require them to enforce the precautionary measures suggested by Dr. Russell.'

We the more readily concur in these recommendations that they are identical with what we have more than once urged, and with the precautions which are adopted voluntarily, under the supervision of a medical board, including Dr. Murchison, Dr. Sieveking, Dr. Whitmore, and Dr.

Hardwick, by the Aylesbury Dairy Company (Limited), a company whose operations as milk purveyors on a great scale have been attended with unalloyed success and great public benefit.

Special Report.

OUTBREAK OF FEVER AT UPPINGHAM SCHOOL.

WE have to report an outbreak of typhoid fever at Uppingham School, which has already resulted in five deaths and over thirty cases. It appears to be clearly traceable to the pollution of the water-supply by sewage. It seems that the first case occurred in June last, when a son of Lord Hawke was seized with enteric fever, and died on the 24th of that month. No other cases occurred until September 21, when another boy in the same house was taken with the fever, and fresh cases continued to occur until October 13, when over thirty boys were down with it, and the death of some of the number were expected.

No notice, it is stated, had been given of this state of things, nor had any investigation been made by the authorities, until it became known in Liverpool that enteric fever was prevailing to this serious extent in the school, when the parents of many of the pupils met, and telegraphed to the head master, calling for an inquiry. The medical officer of health for the district, Mr. Alfred Haviland, then received formal intimation of the outbreak, and after eight days' investigation of its cause, came to the conclusion that there was no doubt that it originated within the house of the lower school. It appears that this house is quite isolated, and has no connection with the general drainage of Uppingham; in fact all the sewage is received into cesspits, which are close to the water-supply. The cisterns supplying the water-closets in nearly all the infected houses are furnished with taps from which the dormitories are supplied with water. Sinks both above and below empty themselves direct into the drains; and, in fact, it would be impossible to find arrangements more directly fitted to engender and spread the special disease which has shown itself at Uppingham School. Though the house in which the fever first showed itself is a splendid mansion, the architect seems to have altogether forgotten to provide for the health of its inmates. Gigantic cesspools were in close relation to the water-supply, and every arrangement was made for the pollution of the air by regurgitation of gases from the water-closets.

The sanitary authorities were not made aware of the outbreak until October 13; they convened a meeting on October 27, when notices were ordered to be served on four of the masters, to remove the nuisances caused by their cesspits. On the 3rd inst. another meeting was held, when the head-master and others were served with notices the same afternoon to remove nuisances arising from cesspits, etc. At the same meeting, a vote of censure was passed on the masters in whose houses the fever had commenced, for their not having immediately communicated with the sanitary authority, instead of allowing the disease to increase as it did from September 21 to October 13. The medical attendant of the school was also blamed for not attending a meeting of the medical men of the town convened by the medical officer of health, and for withholding information from the sanitary authorities.

Mr. Haviland, finding that the healthy boys were allowed by the head-master to go to the infected houses, immediately wrote to him, on his own responsibility, to prohibit the practice. A meeting of the trustees was called; and it was decided that the boys should be dismissed to their homes. The school register contains the names of about 375 boys.

Medical Officer's Report.

THE CONDITION OF THE MID-WARWICKSHIRE SANITARY AREA FOR THE YEAR 1874.*

By GEORGE WILSON, M.A., M.D.

IT has now been our duty to examine a considerable number of annual reports of the medical officers of health appointed under the Act of 1872, and we think that it is impossible that any unprejudiced person can do as we have done without arriving first of all at the conclusion that that well abused piece of legislation has been the means of letting in a vast amount of light upon the sanitary defects of the country; and secondly, at the further conclusion, that Parliament, up to the present time, has not made the best use which it might have done, of the light which has been thus let in. The reports now before us are some of the latest that have appeared, yet they bring out just in the same degree the same defects in sanitary condition and the same difficulties, legal and administrative, attending their removal as were exhibited in the earlier reports (as those of Dr. Bond, Dr. Child, and others) in different parts of the country a year ago.

That bad drainage, bad water-supply, and bad cottage accommodation are the three crying evils of our country districts, and that the existing law is quite insufficient for the purpose of remedying these evils, is, in general terms, the burden of every report that comes out on the sanitary condition of any district of considerable size. This view of the actually existing state of sanitary administration is all but unanimous, and the main requirements by way of remedy are almost as generally agreed upon. There is a most remarkable coincidence of opinion amongst those who are best acquainted with practical sanitary work, to the effect that the following, at any rate, are amongst the conditions absolutely requisite to any serious improvement: (1) The assimilation of rural and urban powers; (2) The granting to all sanitary authorities some power of veto upon the right of building houses upon unwholesome sites; (3) Some power of adding to the supply of dwellings in districts where they are scarce;† (4) The extension of the meaning of the word 'nuisance' beyond the narrow limits to which it was reduced by the decision in the case of *Bishop* v. *The Great Western Railway*; (5) The committing of the sanitary authority to a smaller and more definite body than a board of guardians at large, *e.g.* to a small sanitary committee of the board. This is now only permissive and but rarely done in practice; and, finally, the substitution of 'shall' or 'must' generally for 'may' throughout the clauses of the Act of Parliament which prescribes the duties of sanitary authorities. Yet for not one of these necessary matters is any serious provision made in the sanitary bill at this moment before Parliament, and yet without such provision, expense will continue to be incurred without adequate result in sanitary improvement, till guardians and ratepayers alike become fully possessed with the notion that sanitary expenses are 'all humbug,' or merely a tax paid in deference to the fancies of a few crotcheteers in high places; and sanitary officials get so accustomed to the demand upon them to 'make bricks without straw,' that they after a time arrive at a general conclusion and settled principle that as soon as you recognise that a particular thing ought to be done, you may at once conclude that you have no power to do it. We have said nothing so far upon the feebleness of the present law in regard to the measures which sanitary authorities are able

* *Five Annual Reports on the Combined Sanitary Districts of Saffron Walden Rural and Urban, Newmarket Rural and Urban, Risbridge, Dunmow, and Linton.* By William Armistead, M.B., C.M., F.C.S.

† This has been done in committee in the House of Commons, but it has still to pass the Lords, and even should it do so it may be doubted whether the change is not made in a form likely to introduce further legal quibbles.

to take for the purpose of checking the spread of infectious diseases, because upon this subject it will be necessary to speak again when considering some special portions of Dr. Armistead's report.

The introductory remarks which Dr. Wilson has prefixed to his special report on each district are of great value and as might be expected of far more general interest and concern than the detailed account of the total number of nuisances discovered and abated in each several parish; yet if we interpret Dr. Wilson's opening sentences correctly, this is just the part of his report for which no request is made and no means of payment provided, and the part also which, as our own experience has told us, certain over-busy officials at the Local Government Board are somewhat anxious to suppress altogether, though happily in the board at large such narrow and mischievous counsels have not been permitted to prevail. It is in this portion only of a report that an officer of a combined district is enabled to deal with his district as a whole, and to apply the extended experience which a comparatively large area has enabled him to acquire.

In regard to cottages Dr. Wilson's experience coincides in many respects very closely with our own. Thus he finds that it is practically impossible at present to insist on a cubic space of sleeping accommodation of more than than 200 cubic feet per head. He has discovered, too, that it is the social difficulty which forms the real obstacle to dealing with overcrowding in the houses of the poor, not the legal mystification with which sharp and interested attorneys have occasionally succeeded in hoodwinking incompetent magistrates; but he appears also to have arrived at the same conclusion with other competent judges of these matters, viz., that nothing 'short of imperial interference will effect any permanent improvement.' Let it be remembered that it is of the rural districts that Dr. Wilson is here speaking, and let the cumbersome futility of the Artisans and Labourers' Dwellings Bill of the present session, limited as its action is to places of 20,000 inhabitants or upwards, be taken as a measure of the chance of efficient improvement by means of imperial interference which is at present held out to us.

On the subject of cottages Dr. Armistead does not tell us much in his present report. As he appears, however, to be instituting a careful house to house investigation of his district, we may probably hear a good deal from him on this subject next year. Indications are not wanting that there is plenty of room for improvement in the cottages of his district, as, for instance, when he says, speaking of those in the Newmarket rural district, that 'many are simply wattle and daub.'

With regard to water-supply, the two districts with which we are now concerned would appear to be very differently placed, for while Dr. Wilson tells us that throughout the whole of his district the water is naturally both good and abundant, and makes the instances in which it is artificially polluted comparatively rare and exceptional. Dr. Armistead, on the other hand, tells us that very many of his villages depend entirely on ponds, and that in the union of Risbridge in particular 'in very few parishes is the supply as abundant or as pure as it ought to be, and in parts of some of the parishes there is no water-supply good or bad,' and further, that in some of these cases where villages are wholly dependent on ponds, ditches or streams, 'these are frequently polluted by privies or cesspools placed over them or near them, and are usually dry in summer, and filled in autumn with decaying vegetable matter.' Surely there is something shocking in the fact that things like these are being reported every day, from almost every county in England, and we may be excused when we read and hear and see and smell them for thinking that if our great statesmen would set themselves seriously to remedy such a horrible state of things, and would expend upon so doing about one-tenth part of the energy which they now waste upon struggling for seats on the treasury bench, they would have at the very least a better claim to the character of true patriots than they are ever likely otherwise to obtain.

Dr. Wilson's remarks on drainage and closet accommodation, extending from p. 6 to 15 in his Report, are, for the most part, admirable, and we could willingly, but for the necessities of space, reproduce them in full. Especially we would recommend to the notice, not only of sanitary officials but also of school-boards and clergymen, his strictures, pp. 14-15, on the neglect of sanitary conditions not unfrequently found to exist in parish schools. With regard to the general drainage of villages, we are glad to find that Dr. Wilson fully recognises the fact, that the chief difficulty lies in getting rid of the house-slops, and that this difficulty is one for which the much vaunted dry systems entirely fail to provide a remedy. His description of the system of drainage commonly met with in mid Warwickshire villages is as short and complete and graphic as possible, and might well be taken as that of probably two-thirds of the villages throughout the midland and southern counties of England.

'The shallow road drains which were intended in the first instance to carry off the surface water, and which, for the most part, are either constructed of common drain pipes, or loosely laid bricks or stones, have been converted into common sewers by conveying into them the badly laid and open-jointed drains leading from almost every house or group of houses in the village. If there be a water-course near the village the drainage discharges into the stream by one or several outlets as the case may be, and with what results it is needless to specify. Should it happen, however, that the village is some distance from a stream, then we find the slops discharging into open ditches by the roadside or into field-ditches in the immediate neighbourhood of houses, and thereby often giving rise to filthy nuisances in every direction. This description, of course, only applies to the worst drained villages, but in almost all of them some of these defects are to be met with. Shallow, unevenly laid, and leaky drains are especially common, and as these are not only liable to pollute any wells which may be near them, but in consequence of the want of proper means of flushing permit of filth-accumulations which give off noxious effluvia, they are a source of constant danger.'

As to the remedy to be applied to the state of things thus forcibly described, Dr. Wilson is not quite so clear. He has no doubt as to the necessity of a 'system of drainage' in villages 'of any dimensions,' and believes that on the whole irrigation of land affords the most promising means of getting rid of the sewage at the outfall, if Denton and Field's automatic water-tank be adopted to secure intermittency and rapidity of flow. Even his own not very sanguine anticipations of this system Dr. Wilson is compelled to modify by the admission that 'sewage irrigation has hitherto been held in no small disfavour by farmers,' and we are inclined to think that even if the hitherto insuperable objections of the farmers could be got over, other objections would remain of a still more formidable kind; *e.g.*, in villages such as those described by Dr. Armistead, and to which we have already referred, what is the chance of obtaining at any moderate cost the supply of water demanded for flushing the sewers? or again, in the many villages which lie at the bottom of valleys whence every gallon of sewage would require to be pumped, how is the expense of this pumping to be met? The drainage from farmyards into roads, village streets, and still more into water-courses, Dr. Wilson very wisely, as we think, would propose to meet by insisting on the proper spouting of the farm buildings, thus diminishing as much as possible the amount of surface water to be disposed of, and the construction of a liquid manure tank which should be made water-tight and hold the actual drainage from the dung-heap and pigsty, cowhouses, etc. This it would already be within the competence of the sanitary authorities to order.

Coming, lastly, to the subject of epidemic disease and the existing means of checking it, we are glad to find

Dr. Wilson expressing (p. 16) a strong opinion in favour of the view, frequently urged by the present writer, namely that in the instance of small or scattered country villages, a system of 'quarantining' is more efficient than a hospital system, for the purpose of stamping out an epidemic, though the law does its best to throw difficulties in the way of sanitary authorities in carrying out such a system, by not permitting them to pay the wages of members of families who are quarantined, or of any nurses who may be employed to attend them, unless they are paupers. It is true that both these two expenses can be met, in the single case of small-pox, under section 28 of the Vaccination Act. But it is a notable anomaly that the duty of carrying out the Vaccination Act belongs to the poor-law guardians as such and not as a sanitary authority, and that while the health officer and inspector of nuisances are the servants of the sanitary authority and not of the guardians, the vaccination officer, public vaccinator and relieving officers are the servants of the guardians and not of the sanitary authority. Moreover, as re-vaccination, if only it were properly carried out, ought to be an all-sufficient means of putting an end to epidemics of small-pox, these particular powers are, in fact, less necessary for the purpose of checking that disease than many others.

Dr. Armistead's report is especially valuable in regard to the number of local outbreaks of epidemic diseases, principally typhoid fever, with which he has had to deal, and the care with which he has described them.

The outbreak at Great and Little Sampford, in the rural district of Saffron Walden, is particularly interesting from the fact that Dr. Armistead believes the contagion of typhoid to have lurked about the premises at Gifford Farm for twenty weeks, and the conclusion which he draws from it that 'it is very evident that the disinfection of houses and articles cannot safely be trusted to occupiers.' With this conclusion of Dr. Armistead we entirely agree, at least so far as it applies to the poorer and labouring classes. Our own experience has long since led us to the conclusion that epidemic diseases, with rare exceptions, do not spread in or from the houses of the well-to-do, and do spread both in and from the cottages of the poor. The exceptions which do exist are more apparent than real, for they consist chiefly of those cases in which a large number of children in a family are attacked almost simultaneously, from exposure to the same source of infection. And this comparative rarity of the spreading of disease from a centre in a well-to-do house arises simply from the greater ease with which rich people can practise isolation and disinfection than poor people can, the less importance to them of a little extra expense, their greater intelligence, and the consequent better chance which the medical attendant has of getting his directions properly obeyed. If we are ever to obtain proper power over the spread of epidemic disease while the present state of society subsists, it can only be done by having sanitary authorities who are able and willing to do their work, and entrusting them, for the good of society, with powers which will enable them to exercise an efficient quarantine over the early cases of disease as they arise. If this were properly done the amount of zymotic disease in the whole country might soon become inconsiderable.

With regard to the contagious character of typhoid fever, which Dr. Armistead appears to consider to be a doubtful point which some of his cases here mentioned tend to settle in the affirmative, we cannot but say that our own experience leads us to entertain very little doubt but that it is possible that one person may 'catch' typhoid fever from another; but it does not follow, nor do we ourselves believe, that contagion is the only or the commonest method in which the disease arises. On the contrary, a considerable experience in typhoid fever in country districts, as well as much inquiry among others whose experience has been similar, though not the same as our own, leads us to believe strongly that typhoid fever is far from wrongly named by Dr. Murchison, 'pythogenic,' for that it can not only be fostered, but be produced, *de novo*, by decomposing organic matter, and in most, if not all of Dr. Armistead's cases, foul water or other unsanitary surroundings appear to have been present in greater or less amounts.

In the report upon Newmarket Urban district is an interesting account of an epidemic of small-pox, which, like almost every well worked-out history of an epidemic of this disease, would certainly convince everyone of the efficiency of two measures, viz., vaccination and isolation, for the complete checking of this most horrible disease, if reason had any real share in deciding the conduct of mankind in these matters—which unfortunately it has not. Thus out of a total of 80 cases which occurred in persons who had certainly been vaccinated, 3 only were fatal; among 19 who had not been vaccinated 6 deaths occurred, and among 12 whose condition as to vaccination was doubtful, *i.e.*, who may be presumed to have been either altogether unvaccinated, or vaccinated imperfectly, 8 died, giving a percentage of 2½, 31, and 66 respectively.

The evidence in regard to isolation is more complete still. Thus while the mortality amongst the cases removed to a good temporary hospital was at the rate of 1 in 26, that of those treated at their own homes was 1 in 4¼, and in the workhouse infectious wards, which are described as totally unfit for the purpose to which they were put, it was 1 in 4. Thus much for the effect of hospital treatment upon the patients; as to the effect of it upon the remaining part of the community, we cannot do better than quote Dr. Armistead's own words.

'The number of new cases of the disease during the ten weeks before the establishment of the hospital, counting from the first imported case on May 14 to July 24, was, for each week respectively, 1, 0, 2, 0, 3, 2, 3, 0, 12, 39.

'After the opening of the hospital, the number of fresh cases for each week was 21, 12, 13, 1, 1, 0, 0, 0. Reckoning up to the time when the last patient was convalescent and able to be discharged from the hospital, could anything more clearly demonstrate the value of isolation in preventing the spread of contagion? The gradual spread of the infection when the morbific germs were thrown off from but a few patients; the rapid spread when the number of infected persons was greater; the threatened still greater development of the disease, each week, as the centres of infection multiplied, and were dispersed in every quarter of the town, and several parishes of the rural district; the opening of the hospital at a time when the disease was increasing most rapidly; the large number of cases, all previously infected, which occurred in the following two weeks, each one a source of further infection; and the very sudden stoppage of the epidemic as soon as all the infected persons had been isolated.'

Finally, there are two matters mentioned in connection with an outbreak of small-pox at Sawston, in the Linton district, which are of special interest. The first is that Dr. Armistead, after inquiry, has come to the conclusion that the outbreak was traceable to rags in a paper factory. This had been previously believed, but, as is usual in such cases, denied. But Dr. Armistead is of opinion that there is no room for reasonable doubt about it. We have always ourselves felt that rag shops and paper-mills required more stringent regulations than any to which they can at present be subjected. It is true that in a report on the rag trade specially made some years ago by Dr. Bristow, to the then medical officer to the Privy Council, it was stated that 'in very few instances has any outbreak of disease been traced to them.' But when we consider the very questionable places from which 'rags,' often come, and the old bones and other organic filth with which they are commonly associated, it is impossible not to feel that the result is more likely to follow from the difficulty of the investigation than from the rarity of the connection suggested. At all events, here is a case in point, and one case on the positive side is worth a hundred on the negative. If we are not wrongly informed, there is at present no law to compel owners of paper works to disinfect the

rags that they accumulate. There can, we think, be no reasonable doubt that some such provision ought to be made at once, though it might be a question whether the paper-makers should be the subjects of the requirement, and not rather the rag merchants, who are the first-hand accumulators of these abominations, and who, moreover, are more apt to have their places of business in thickly-populated neighbourhoods than are the paper-makers themselves. But whatever else is done, the greatest precaution should be taken to prevent in these cases, and all others, inefficient, or merely colourable disinfection, which, like sham quarantine, only does more harm than good by giving people a confidence that all is safe when no safety whatever is in reality insured. This is exactly what happened in the case before us; for Dr. Armistead was informed that the rags were regularly disinfected; but when he came to make a personal inspection, and to learn the process employed for this purpose more accurately, he found that the custom was to pass a quantity of chlorine gas into the room where the rags were. But he says: 'As the rags are in large masses and the cubic space of the room great, it is not very probable that the gas will penetrate sufficiently to disinfect the rags in the middle of a large collection.' We should be inclined to say that, on the other hand, it is very certain that it will not do so.

The other matter to which we refer is the fact that, when Dr. Armistead applied to be permitted to inspect this factory, permission was refused, on the ground that the mill was regularly inspected under the Factory Acts. We are happy to be able to add that this claim to exemption from the action of the Sanitary Acts was disallowed by the Local Government Board when applied to on the subject, and the inspection accordingly took place.

We have noticed these two able and interesting reports at considerable length; but we cannot think that we owe any apology to our readers for so doing. The fact is that reports such as these are gradually coming in from all parts of the country in which sanitary districts have been formed of sufficient area to supply an adequate field of observation and experience, from which a competent officer may be enabled to judge of the sanitary conditions and sanitary requirements of the country. These reports show certain defects as existing very generally over the country, they agree to a most remarkable extent as to what these evils are, and as to the insufficiency of the weapons at present in the hands of the sanitary authorities with which to contend with them. They show considerable reason to doubt as to whether the existing authorities can ever become an efficient administrative organisation for the purposes required; and above all they show this, viz., that a large portion of our poorer classes, classes too which are daily growing in political importance, are living under sanitary—or unsanitary—conditions which are incompatible with civilisation, morality, intelligence, or self-respect, conditions in which, while contentment would mean merely hopeless degradation and gradual relapse into barbarism, discontent means social and political, no less than physical danger to others as well as to themselves. If the result of Mr. Stansfeld's much-abused legislation of 1873 is at length to awake our statesmen to a thorough consciousness of the volcano upon which they are playing, he may yet live to see a very different value set upon his labours than has yet been accorded to them.

Law Reports.

A SECOND OFFENCE.

MR. SEEGER, the proprietor of the steam saw-mills in St. Pancras, has been again summoned for causing a smoke nuisance. On the first occasion he was fined 10*l.*, and on the second the penalty was doubled.

OVERCROWDING IN A SCHOOLROOM.

AT the Borough Police Court, Sunderland, on the 15th ult., Mary Hall, mistress of a school in North Hedley Street, was summoned at the instance of the medical officer of health, for overcrowding her schoolroom. The town clerk prosecuted. From the evidence of sanitary inspector McKay, it appears that he visited the defendant's house and found fifty scholars in a room measuring 11 ft. 6 in. by 12 ft. 6 in., and 9 ft. in height. He cautioned the defendant, and afterwards called again, and found twenty-four scholars. These he considered were too many, and reported the case to the medical officer. Dr. Yeld deposed to visiting the defendant's house, and finding it so overcrowded as to be injurious to the health of the children. He also stated that he had recommended the defendant to reduce the number of scholars, and charge a higher school fee. The Bench advised the defendant to act upon the medical officer's advice, and adjourned the case for a month to give her an opportunity of doing so, to which she readily assented.

COMPLAINT AGAINST A WATER COMPANY.

THE East London Water Company have been summoned by J. Grimes, 8 Osborne Street, Whitechapel, to answer his complaint that since August 8 last they had failed to supply water to his premises, and to settle certain disputes which had arisen between him and the company as to the charges for a supply.—Mr. Wontner said that the proceedings were taken under the Metropolis Water Works Act, 1870, section 31, which gave a court summary jurisdiction to settle the matters in dispute. It was not a question of penalty, although the complainant might have sued for the fine of 200*l.* for the first month, and 100*l.* for the second month. He did not, however, wish to go for the penalty; and the settlement, therefore, simply left the costs, if ordered, to be paid by the party in default. The dispute arose on August 13; up to that time, from the time the house in question was built by the complainant, no complaint had been made, although his fittings for the water-supply had been inspected every year by the company's officers. On June 1 last the company gave notice of regulations made by them as to fittings ordered by them with a view of preventing waste, and required all proprietors on whom the notice was served to supply the fittings selected by them. These were found to be a stop-cock with brass ferule, equal to a half-inch pipe. They had also made regulations making it obligatory to employ the company's workmen, and pay the company's reasonable charges. Further, they imposed a penalty of 5*l.* for default, made the occupier or owner liable to have the water cut off, and, lastly, to be proceeded against for a nuisance. The complainant was willing to supply the screw ferule, and that was done on August 12. The company's inspector had, prior to that, seen the fittings of the house, and inspected the closets, making some suggestions that a waste preventer would be necessary there—a waste preventer being a small tank for the closet supply inside the larger one. It was understood, however, that the joint should remain, and that the brass ferule should be put on. On August 12, the complainant found that, having put on the brass ferule, the company's workmen had entered the house, and, going into the closets, had told his servants that the pipes could not be allowed to remain. The servants said that in the absence of their master, who was then from home, they could not allow the pipes to be removed, and then the workmen said that they had orders to cut off the water, and they did so. For twenty-four days the complainant was left without water, and it was not until he came before the magistrate, and, on the magistrate's suggestion, the company was written to, that the water was put on 'without prejudice.' During the twenty-four days the complainant was liable to be prosecuted by the sanitary authority, and they were unable to help him as to obtaining a new supply. The 21st section

of the Act made it obligatory on the company to give notice to the sanitary authority, but it was not done in this case, and there was no penalty on the company for not doing so. On the contrary, they, having cut off the water, practically said to the complainant, 'We will keep you without water to compel you to supply the fittings we require, at an expense of about 14*l.*, and if you don't supply them we will put you under the thumb of the sanitary authority, and you may be indicted for a nuisance.' Mr. Wontner said that if he proved the case he had opened he thought it would show a most arbitrary act on the part of the company.—At the conclusion of the evidence the case was adjourned for a fortnight.

SCOTCH GRAVEYARD CASE.

SHERIFF-SUBSTITUTE SMITH, at Greenock, has issued the following interlocutor:—The churchyard, cemetery, or place of sepulture complained of is situated within the burgh of Gourock; it extends to one rood twenty-eight poles and twenty-seven yards or thereby, and contains about 1,200 lairs; the width of the lairs is, as a rule, only two feet; there is no complete and accurate register of the interments, and no means of ascertaining whether a lair is occupied or not; actual investigation, either by opening the ground or by sounding it with a spear or other instrument, that part of the soil is well adapted for a burying place, but one-fourth of it is ill adapted therefor, in consequence of its being of a mossy nature; in that mossy part water is frequently found standing in open graves to a depth that renders them ill suited for interments; owing to the lairs being only two feet wide, the coffins in adjoining graves are often partially exposed when a grave is opened, and that very noxious gases sometimes escape into the atmosphere in consequence; it is not possible to regulate the use of the burying ground so as to avoid this danger, because there are no means of ascertaining accurately the contents of the graves; a large proportion of the graves is under a depth of three feet, and a depth of three feet is the smallest at which bodies can be interred; the said churchyard, cemetery, or place of sepulture, is so crowded with bodies, or otherwise so conducted as to be offensive or injurious to health, and constitutes a nuisance within the meaning of head (I.) in section 16th of the Public Health (Scotland) Act, 1873: Therefore, ordains the same to be closed. The Sheriff-Substitute concludes thus:—'The question remains for determination whether the use of the burying ground can be so regulated as to obviate all danger to public health, and offence to public feeling, and with every desire to find means to reconcile his duty to the public with the desires and expectation of many whose kindred lie buried there, the Sheriff-Substitute has arrived reluctantly at the opinion that no regulations which could be made would suffice to secure that result. The facts that the contents of the ground are accurately known to none, that the rude and unseemly process of spearing is of necessity habitually resorted to for the purpose of ascertaining whether a grave is occupied or not, that the graves are all so close together, that in no part can one be opened without the risk of the escape of poisonous gases from the neighbouring tenements, all seem to show that no security can be found short of absolutely closing the ground.'

EXPOSURE OF SCARLATINA PATIENTS: FLAGRANT CASE.

J. BOTHAMLEY, bread and flour-seller, was charged at the Isle of Ely police-court, by the inspector of nuisances, with wilfully exposing two children suffering from scarlatina on the highway, without taking proper precautions against spreading the said disorder.—Mr. Collins, clerk to the rural sanitary authority, said the prosecution was instituted under the Sanitary Acts, and it was a case of considerable aggravation, inasmuch as, a few days previous to the offence, the medical officer of health and the inspector of nuisances visited the defendant, and cautioned him against exposing his children.—Dr. Bury, medical officer, said: I visited the house of the defendant on June 18, and found that the children had been suffering from scarlet fever. They were in such a state that the disease could have been communicated by them to other children. I thought the case was more than usually serious, because I found one of the two children in the bakehouse leaning over the open flour bin. The skin was peeling off, and I consider that an infectious state. On June 25 I again visited the defendant's house, and saw the same children. I examined them, and considered them infectious at that time also. There is a garden contiguous to the defendant's house, but it was an improper place for the children to be in, as it is as public as the road, people having to pass through it to get to the shop. On June 18 I told the defendant that it was against the law to expose his children either in the bakehouse or the shop, or on the road, and I advised him to confine them to his dwelling-house. I also instructed him as to the use of disinfectants. I told him that he was liable to a penalty if he exposed the children while they were in the state they were at that time. The defendant told me on one occasion that his medical attendant said the children might go out.—Mr. Ollard said that he should rest his defence upon two points. First, that there was no danger to the public by the children going on the road, and that his client did not know that the disease was infectious; secondly, that the defendant did not wilfully expose the children. If the defendant had, contrary to the advice of his medical attendant, taken the children out upon the road, he admitted that he would have been wrong. The defendant, however, did not so act. He contended that if the defendant, acting on the advice of his medical attendant, had taken the children out it would not be a case for the bench to convict upon. He admitted that the children got out, but he submitted that there was no offence on the part of the defendant. The defendant was not aware of the children being out, and had no knowledge of the dangerous character of the disease. He should call Mr. Maynard, who attended the children, and who advised the defendant to let them have as much fresh air as possible. Under these circumstances, he contended that there had not been a wilful exposure of the children within the meaning of the act.—Mr. J. C. Maynard stated: I attended the defendant's children, who were suffering from scarlatina. It was a mild attack, and they were not confined to their bed for a single day. I consider that all children suffering from an infectious complaint are better in bed. On June 22, the defendant's children were convalescent, or thereabouts. I have ceased to attend them. I told the defendant and his wife to give the children good nourishment, and let them have fresh air. If they had been my children I think I should have sent them out. The last time I saw the children the skin was peeling off. Medical men differ in opinion as to the duration of infection, some say six months and others six weeks. I do not consider the disease was infectious at the time in question, although I should not have cared for them to have mixed with my own children.—The Chairman said they considered the defendant had not exercised sufficient care over the children, and he would have to pay a small fine—5*s.* and 1*l.* 9*s.* 6*d.* costs.

Correspondence.

THE FACING OF TEA.

(*To the Editor of the* SANITARY RECORD.)

SIR,—Mr. Wanklyn's letter on the above subject involves some very serious considerations, and is likely to have a marked influence on account of the position of the writer. If the facing of tea were a perfectly innocent

process, and a necessity for the production of an article for which there was a demand, then it might be unadvisable to interfere with it. But it is by no means sure that the process is innocent, for it introduces several substances, some of which if swallowed may act as mechanical irritants (as china clay, etc.), whilst others (such as Prussian blue) may have a poisonous effect. Again, the process by which the facing is accomplished is certainly not always a clean one, introducing as it does into the tea exudations from the skin of the operator, not to mention the chance of other even more disgusting substances, such as eruptive scales, scabs and parasites. I do not say that such things have been positively recognised in tea, but the process of preparation certainly risks their introduction more in the case of green than black tea. Again, real green tea is drunk in China by the natives themselves, but does any Chinaman ever use a faced tea? I think not; I believe it to be exclusively an English 'pigeon.' We may conclude, then, that facing is not essential to the preparation of green tea, and if this be the case, on what ground can it be defended? Surely it is no argument to say that the butter-maker and the cheese-maker tint their wares; on the contrary, the sooner these are stopped from doing so the better. As to the dying of woollen, silk, and other fabrics, Mr. Wanklyn can hardly be serious in placing it in the same category; it is not an adulteration, but a process of recognised utility. I am no advocate for harassing any trade, but the danger of giving such latitude as Mr. Wanklyn suggests is very great, it being quite impossible to draw the line at any particular point. As a corroboration of the statement that green tea does not require facing, and may be imported without it, we have in to-day's *Times* a letter from Messrs. Binyons, Robinson and Co., of Manchester, who state that, while they import no faced tea, 'tons upon tons' of pure green tea have passed through their hands during the last year or two. F. DE CHAUMONT.

October 30, 1875.

QUERIES RELATING TO ENTERIC FEVER FOR THE MEDICAL OFFICERS' OF HEALTH ASSOCIATION.

(*To the Editor of the* SANITARY RECORD.)

SIR,—It is well known to some people that enteric fever prevails almost always in this district; especially to the officials of the Local Government Board, who have time after time investigated the cause of sudden and alarming outbreaks, and declare the disease to be endemic in it. May I ask these gentlemen what should make enteric fever endemic in the Chesterfield Union more than in any other union in England if it did not originate in local circumstances or insanitary conditions?

Again, it will be admitted at once, I presume, by all reasonable persons that those medical men who have seen the most of enteric fever, *cæteris paribus*, should know the most regarding its nature, origin, and mode of communication. In my district there are upward of twenty medical gentlemen in practice, and every one of them believes in the *de novo* theory of the disease, and hardly any in its power of communicability. Is it probable that all these men, who have almost every day cases of enteric fever under their care and treatment, are deceived?

Further, in the Brampton and Walton local board district, in this union, which has been free from all zymotic diseases for the last eight months, in less than four days last week forty persons were the victims of enteric fever sprinkled over an area of 10,000 acres; was it likely that the poison in this instance spread by contagion, or infection, or both; from infected persons or things?

ANGUS MACKINTOSH, M.D.,
Medical Officer of Health, Chesterfield.

THE GOUX SYSTEM.

(*To the Editor of the* SANITARY RECORD.)

SIR,—My attention has just been called to a letter signed 'H. H. P.'

This system is called by the name of its inventor, M. Goux. There is nothing 'queer' in this. Your correspondent, should he ever invent a system, might call it the 'P' system if he likes.

'The liquid conveyed by sewers' consist of sewage, which is made up of fæces and urine; fæces and urine are received into the Goux tubs and scavenged away.

If your correspondent calls slop, rain, and other water, 'real sewage,' he can do so.

If he thinks a water-closet a great promoter of civilisation he can do so; but I see no necessity for his recording his thoughts.

I have to deal with the sewage disposal of over three hundred villages (365). I want the fæces and the urine to be taken away from positions where they pollute our air and water-supply. I find the ordinary earth-closets complicated in machinery and expensive; I cannot, therefore, recommend their use generally. Whilst at Aldershot, where I went to see a sewage farm, my attention was drawn by an officer to the latrines, where I saw the Goux system in operation. I saw at once its applicability to villages and to towns. With the slop-water which your correspondent calls 'real sewage,' if I understand him rightly, I had nothing whatever to do. I simply wanted in my letter to point out how fæces and urine, which I call sewage, might be easily disposed of instead of being allowed to pollute air and water and thus produce enteric fever.

I believe the system is thoroughly good if properly carried out, and so earnest am I in this belief that I have just recommended it to the authorities of a town where there is raging at present an outbreak of enteric fever, caused by keeping fæces and urine in cesspits until their fermentation has polluted everything within their reach.

The water-closet may be a great promoter of civilisation according to your correspondent, but of course all depends upon what he calls civilisation.

With the sewage of London forming shoals in the Thames before our eyes, I fancy we must hesitate before we accord so much *κῦδος* to the water-closet. In fact this mode of sewage disposal always puts me in mind of the man who, when he had accepted a bill, fancied that he had paid his account! Fatal delusion; we only get rid of the sewage in the pan by washing it out of sight for a time. Sewage, however, like a bill, will mature, and its presentation is not the most desirable thing on earth.

Londoners may not have their bill presented at present, but they may depend upon this, that the day will come when they will bitterly repent of their thrusting their sewage into the Thames instead of on the land; the accumulated sewage silt now forming will one day, I believe, rise up in judgment, and I doubt not but that the so-called civiliser, the water-closet, will be found to be a gay deceiver.

I know of no system, save the Goux, that is so admirably adopted, under proper regulations on the part of sanitary authorities, to meet the difficulty of sewage disposal in towns and villages, and at the same time ensure the return of the sewage to the land whence it came.

In times of emergency, as in a sudden outbreak of typhoid fever, it is well to be able to adopt a fresh system within twelve hours. ALFRED HAVILAND.

Northampton, October 27, 1875.

SUBURBAN HOUSES.

(*To the Editor of the* SANITARY RECORD.)

SIR,—I have lately had my attention called to a new neighbourhood situated between the Harrow and Kilburn Roads. It seems that when a child dies of diphtheria the authorities are apt to insist on the dust-bin being placed farther from the house, but there are houses in which the dust-bin is merely a cupboard of the kitchen or any odd corner in the area, and about such the authorities will probably not trouble themselves until death draws their attention to them. Again, as many of the houses fall into the hands of those who have advanced money on them to speculative

builders, the owners apparently are content to lease the property to any householder for a moderate rent on condition that he will attend to the necessary repairs, etc. Consequently, money being a scarce commodity with those who are induced to take small houses on such terms, the drains are left to take care of themselves, and the basement must be almost flooded before they can be induced to take up the boards. In a new neighbourhood the water pipes are continually being cut off from leakage caused by bad roads; but as borrowing water from neighbours is troublesome, the tenant, after a few days employs a couple of men to remedy the evil. Being below the level of the canal in many places (Queen's Park Estate for instance) and at the bottom of Maida Hill, there is little chance of the surface water escaping from the district. Any one who has been obliged to attend a funeral at Kensal Green must be aware of the nature of the clay, which is barely covered with soil. What I would ask leave to suggest is, that inspectors be authorised to overlook the sanitary arrangements of each house, and in the event of disease arising from want of proper sanitary accommodation the inspector be dismissed for negligence. ALLENDALE.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

BANKS. William, Esq., has been appointed Chairman of the Wigton Urban Sanitary Authority.

BLUNN, William, Esq., has been appointed Chairman of the Swinton Urban Sanitary Authority.

BRIDGE, William, Esq. has been appointed Treasurer to the Swinton Urban Sanitary Authority.

CARRICK, Joseph, Esq., has been appointed Treasurer to the Wigton Urban Sanitary Authority.

CROSTHWAITE, Mr. Joseph, has been appointed Surveyor, Inspector of Nuisances, and Collector to the Wigton Urban Sanitary Authority.

FENWICK, Mr. George, has been appointed Surveyor and Inspector of Nuisances for the Bedlingtonshire Urban Sanitary District, vice Robson, resigned: 150*l.* per ann.

HARRISON, Jonathan Atkinson, M.D. Univ. Glasgow, L.S.A. Lond., has been appointed Medical Officer of Health for the Haslingden Rural Sanitary District, for six months at 100*l.* per ann.

HARROP, Mr. Frederick Lee, has been appointed Clerk to the Swinton Urban Sanitary Authority.

MCKEEVER, Mr. James, has been appointed Clerk to the Wigton Urban Sanitary Authority.

PRITCHARD, Robert Clement, L.F.P.S. Glasgow and L.M., L.S.A. Lond., has been appointed Medical Officer of Health for the Wigton Urban Sanitary District, 40*l.* for one year.

RAWLIN, Mr. George, has been appointed Surveyor, Inspector of Nuisances, and Collector to the Swinton Urban Sanitary Authority.

SHORT, Mr. Richard, has been appointed Collector to the Bedlingtonshire Urban Sanitary Authority, vice Robson, resigned: 100*l.* per ann.

VARLEY, Mr. J. C., has been appointed Surveyor and Inspector of Nuisances for the Heywood Urban Sanitary District, vice Hildred, resigned.

YELD, Henry John, M.D., has been re-appointed Medical Officer of Health for the Port of Sunderland: 20*l.* per ann.

VACANCIES.

DORCHESTER. Surveyor to the Corporation and Urban Sanitary Authority.

LUTON URBAN SANITARY DISTRICT. Surveyor and Engineer: 200*l.* per ann. and house. Application, 8th instant, to George Bailey, Law Clerk to the Authority.

NEWINGTON, YORKSHIRE, URBAN SANITARY DISTRICT. Surveyor, Inspector of Nuisances and Collector: 125*l.* per annum to commence with. Application, November 10, to C. J. Todd, Clerk to the Authority, 15, Bowl Alley Lane, Hull.

SPENNYMOOR URBAN SANITARY DISTRICT. Surveyor and Inspector of Nuisances: 130*l.* per ann. to commence with. Application, 10th inst., to W. B. Dyson, Clerk to the Authority.

STOCKPORT. Surveyor to the Corporation and Urban Sanitary Authority. Application, 15th inst., to Walter Hyde, Town Clerk.

SANITARY PATENTS.

1813. Ventilators for sewers and drains. Benjamin Crocker Cross, Redhill.

1847. Earthenware pipes. Henry Doulton, High Street, Lambeth.

2125. Essence of meats. Alfred Philip Wire and William Gostwyck Gard, Dunstable.

2358. Treating sewage. James Odams, Fenchurch Street, London, and Robert Blackburn, Trews Weir Mills, Exeter.

2401. House traps. Edward Gregson Banner, Billiter Square, London.

3248. Improvements in the manufacture of soap. Samuel Shaw Lewis, Southampton Buildings, and Auguste Copié, Bolsover Street, London.

3294. An improved process and apparatus for generating and purifying ozone. William Robert Lake, Southampton Buildings, London. A communication from Frederick William Bartlett, Buffalo, New York, U.S.

1970. Warming and ventilating. George Livermore Shorland, Manchester.

2213. Heating water, etc. James Reilly, Manchester.

2533. Washing and wringing machines. Robert Thompson, Leeds.

ABSTRACTS OF SPECIFICATIONS.

502. Fertilisers. B. Ackerman, New York.

This invention relates to the preparation of stable manure in city stables by a cheap and expeditious process of forming in bales by simple compressing and banding.

503. Coffins. W. Kirby, Derby.

The invention relates to forming coffins of various descriptions of basket work on a wooden bottom or frame, and securing the lid to the body of the coffin by metal bands, soldered or sealed to prevent illicit opening, which bands also serve to receive inscriptions. The object being to obtain a light and economical coffin and one which will facilitate the decomposition of the deceased. If required these coffins may be made water-tight.

507. Water-closets. J. Broadfoot, Glasgow.

In one modification suitable for houses or ships the bottom and outlet of the closet basin is cemented into the top of a hemispherical metal shell, which is bolted to a reverse hemispherical part formed at the top of the soil pipe. The valve or closing detail is a segmental spherical shell inside the spherical casing, and closing up against the top opening into the casing. In the second modification, which is more especially designed for ships, the upper part of the valve casting is the same as in the first modification and is fitted with a similar segmental spherical valve. The mouth or top of the soil pipe is enlarged to receive a second valve, which is, however, arranged, so as to require no additional joints in the casing. An inclined valve seat is fixed down on flanges or snugs formed for it inside the casing or enlargement, and a flap valve is fitted to close against the underside of the valve seat.

649. Water-closets. S. H. Rowley, Swadlincote.

This invention refers to those closets which have an outlet pipe at the side of the basin, and in which a certain amount of water remains at the bottom of the basin, not to form a seal, but to receive the soil. The provisional specification describes admitting the whole or the greater part of the flushing water to the basin to a point diametrically opposite the outlet, so as to ensure that the contents of the basin are carried off.

693. Water-closets. J. Storer, Birmingham.—A communication from W. S. Cooper, Philadelphia.

According to this invention the water-supply cock is opened and closed by a weighted lever actuated by a second weighted lever, which latter lever works the tilting pan of the basin, to which pan it is connected by a slotted arm and pin. The weight of the tilting pan lever serves to couple the said lever to the hand rod by the lifting of which the mechanism is brought into action. The combined weight and coupling is capable of being adjusted on the end of the tilting pan lever both vertically and horizontally, and the hand rod is coupled to the said weight by a kind of ball-and-socket joint, which permits the weight to turn freely on the lever without obstruction to the proper working of the other parts of the mechanism.

730. Ventilating rooms and buildings. J. Currall, Birmingham.

This invention consists of arrangements of openings either in the window sashes or sash frame, which openings by the positions of the sashes are covered or uncovered, and the ingress of fresh air, and the egress of vitiated air permitted or prevented at pleasure. Also applying similar arrangements to doors in combination with sliding or hinged plates for covering or uncovering the air openings. Also adapting to ceilings and roofs an arrangement for permitting of the escape of vitiated air at the ridge tiles; and further, an arrangement of ventilator for chimneys or flues and walls, in which the exit passage is small compared with the entrance passage.

652. Preserving meat and provisions. P. O. Francis, Nine Elms Wharf, Vauxhall.

This consists in coating provisions with wet Portland cement, plaster, or other similar cementaceous body which, when dry, prevents the entrance of any decomposing agent.

1120. Water closets. M. H. Brown, New Cross.

The feature of novelty of this invention consists in introducing disinfecting or deodorising fluid into the trap of a water closet instead of into the pan as heretofore. The means to attain this object are to cast or place on the side of the water-closet pan a reservoir containing the fluid, which is connected with the container by a pipe furnished with a double valve and valve chamber; the said double valve is connected by a rod and lever with the main lever of the closet, so that when the handle of the said main lever is lifted up, the fluid will fill the valve chamber, and flow into the container when the handle is released.

1029. Tank filters. G. Burney, Millwall.

The improvements relate partly to the construction of tank filters and partly to the arrangement of the filtering materials, so as to admit of their being removed and replaced by other filtering trays. Also to the method of attaching cement to the inside of the tank or to other metal surfaces.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer—not necessarily for publication.

Mr. J. C. DENNIS's communications will appear next week.

THE International Exhibition at Brussels will open on June 15, and close on October 1 next year. It is distinctly stated that nothing will be admitted unless 'distinguished by merit, interest, or superiority of some kind;' but each exhibitor will receive a certificate to the effect that his goods have been thought worthy of admission. Prices may be attached, and articles that can be readily replaced may be removed from the building when sold. A charge of not less than 30s. is to be made for space, and the exhibition is to be confined to articles bearing upon public health and public safety.

THE NEW YORK HOTELS.

MR. JAMES HARRISON, superintendent of rates and surveys for the New York Board of Underwriters, has recently examined the hotels in that city. In the course of his report he says, 'Of the sixty-nine hotels, twenty-four have frame Mansard roofs, thirty-nine have wooden cornices, thirty-five have unsafe gas brackets, twenty-five have unsafe steam pipes, twenty have unsafe flues or fire-places, forty-nine have unsafe laundries or drying rooms, fifty-one have uncovered lights in basements or wine cellars, twenty-five have repair shops in the buildings, thirty-two have unprotected boilers, twenty-six open ventilators. Stairways are all open. Thirty-three of these hotels have four of these several defects. Not one hotel exists of this number but has one or more of these defects. I scarcely need call attention to the fact that these buildings range from five to seven storeys in height, with tortuous passage-ways or halls, confusing to strangers under the most favourable circumstances, difficult of access to our fire department, and but few of them provided with appliances for extinguishing a fire, while the sparse provisions that are made would in most instances be useless, having no organised body to use them in case of emergency.

DISINFECTANTS.

OF disinfectants sufficiently inexpensive for general use—cheapness being an important desideratum—next to carbolic and cresylic acids are placed zinc salts, and after them manganese and iron salts. The action of these substances upon putrid material has been the subject of much study, since by that means it has been hoped that the true nature of infection may be discovered. Those substances found to be most efficient have been observed to be agents which coagulate albumen, and hence, as an outgrowth of the germ theory, combined with the fact that contagion and putrefaction, if not identical, require exactly similar conditions, the assumption was made that the germs causing infection or contagion contain albumen, which is essential to their existence. Hence, that which coagulates albumen, disinfects. This theory was promulgated by Dr. Hirsch, in 1869, but it will not account for all the phenomena of infection, and is therefore open to serious objection. It has been shown that cresylic acid, which is a more powerful disinfectant than carbolic acid, has not so much power to coagulate albumen. Dr. Angus Smith has also demonstrated that the coagulation of albumen, though it retards, does not absolutely prevent putrefaction. Moreover it is stated that a solution of carbolic acid one in one thousand may be made, which, though too dilute to coagulate albumen, may yet disinfect.

DRESSES FOR NURSES.

MRS. BERTHA ADAMS (authoress of a very interesting paper on 'Sick Nursing,' in *Chambers' Journal* of Sept. 11) writes very sensibly to a contemporary in defence of a special dress for nurses.

'Various objections have been made to the dress worn by our various sisterhoods. Now, I think those who make these objections do so in ignorance of the many strong reasons that exist for the adoption of a distinctive dress in such cases, and the idea that there is any dislike among the poor to the sisters' sombre attire is quite erroneous; on the contrary, I have myself seen several instances where the outward appearance of the sister has carried weight, commanded respect, and caused advice to be listened to and acted upon, which I am convinced would have been otherwise neglected. On one occasion I was accompanying a friend who wore the sister's dress on an errand where time was valuable. We went by the Underground, and when the train came up every carriage was full, crowded with working men returning to their homes. The guard shook his head, and evidently considered our case hopeless; but no sooner did my friend appear at the door of a third-class carriage than the working men expressed in homely but forcible language a determination she should find a seat; for who knew but she was going to some "poor sick crittur or another?" So two of the men stood for the rest of the journey, and tried to make her as comfortabte as circumstances would permit, evidently showing a certain amount of deference to me, simply because I was in such good company.

VACCINATION NOTICES.

THE following, which appears in a contemporary, may convey a useful hint.

'SIR,—For some time past many of my patients have been much annoyed by having post-cards like the enclosed sent to them by the public vaccinator of this district, months (in some cases) after the child had been vaccinated by me, and the certificate duly transmitted to the vaccination officer. Will you kindly suggest a remedy against this growing nuisance? The town crier is sent round periodically to warn the inhabitants that if they have not their children vaccinated by this public officer at the next public vaccination, they will be subject to a penalty. Is there any clause in the Vaccination Acts or in a public vaccinator's contract, to warrant this? A great number, being ignorant of the law on the matter, think from this proceeding that they are compelled to have the operation performed by the said officer, no matter whose patients they may be, and only find out their mistake by inquiry. I am, etc.,

'B. J. GLISSAN, Lic. Physician, etc.'

[It rests with the guardians and the vaccination officer (not with the public vaccinator) to notify to parents the times at which public vaccination is performed. If the guardians choose to take exceptional means (even by the employment of the town-crier) simply to give publicity to the arrangements for public vaccination, they are clearly within their right. But the law merely requires the vaccination of children, not their vaccination by the public vaccinator; and a notice 'to warn the inhabitants that if they have not their children vaccinated by the public officer they will be subject to a penalty' is obviously unwarranted. Our correspondent should make complaint to the Local Government Board, forwarding one of the cards issued by the public vaccinator to whom he refers.]

PIG-KEEPING.

(*To the Editor of the* SANITARY RECORD.)

SIR,—I beg to enclose the following observations on a common subject; if you feel disposed to insert it, I shall not be displeased at any adverse criticisms from any party whatever.

Keeping Pigs.—One of the difficulties a sanitary inspector comes in contact with in the performance of his duties, is the keeping of pigs by poor people in his district, and the obligation laid upon him to persuade or compel persons to keep these animals in such a manner as not to be a nuisance or injurious to health. Keeping pigs in many cases is almost a necessity to many families having gardens. It is a savings bank in the summer for the wants of the winter. It consumes all vegetable refuse instead of its being left to rot and putrify on the premises, breeding foul air and fever, and creates home occupation for the man, which in itself is of great importance, and ought not to be discouraged.

The Law on Keeping Pigs.—By law any persons may, under certain restrictions, keep pigs without any license whatever, and any by-law or rule of any sanitary authority forbidding this right is bad in law, and cannot be enforced; the restrictions imposed by law are as follows:

1. Pigs may not be kept within any dwelling-house.
2. In any urban district pigsties may not be kept in front of any street, except shut out by a wall or fence.
3. Pigs may not in any case be kept so as to be a nuisance or injurious to health; this restriction is most imperative. Officers being appointed, whose duty it is (even when no complaint has been made to them) to compel the suppression of nuisances.

How to keep Pigs.—1. Select a suitable place for the pigsty, not too near a dwelling-house, nor too close to your neighbour's premises, lest any temporary smell may give offence; if possible, choose a spot that is shaded in the summer, but if this is not possible, plant two or three trees on the south side of the sty.

2. Pave the sty all over, the part which is under cover as well as that which is open to form the bottom to drain the sewage into a tub sunk into the ground, or some other receptacle outside, that the sty may be thoroughly scoured and cleansed periodically.

3. Provide the covered portion of the sty with a proper and sufficient supply of litter (if possible, that which has been used by horses, as it will deodorise the smell from pigs), and otherwise attend to the comfort of the animal; it will repay you by extending itself and growing fat.

4. When the dung is removed from the sty, immediately cover it with a layer of earth, so as to form what is called a dung mixen; it will prevent any nuisance, and make the manure much more valuable for the garden.

A pig well kept is a pleasure to look after, a profit to the family, and a credit to the man who keeps it, and probably a benefit to the community at large. I should like to see annual prizes offered to cottagers who kept their pig or pigs in the best and most approved manner.

In my experience, which has not been small, I have observed that when the pig is dirty and improperly kept in the sty, the children are untidy and unlovely in the house.

JOB HEATH APTED,
Inspector of Nuisances for Reigate
October 26, 1875. Borough Urban Authority.

EARTH TO EARTH.—The superiority of the London Necropolis (Woking Cemetery) has been specially recognised in the *Times*, and other leading journals, and it is admitted that here only can the burial of the dead be properly carried out. The Company is prepared to conduct Funerals without the intervention of the ordinary undertaker at any stage of the proceedings. Prospectus free.—Office, 2 Lancaster Place, Strand, W.C.

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Original Papers.

DISINFECTION AND DISINFECTANTS.

BY H. C. BARTLETT, PH.D., F.C.S.

EVERY sincere attempt to arrive at distinct definitions of the causes and principles involved in the piecing together of the scattered rudiments of a science, yet to be formulated, must tend to promote confidence in the hope that a stage beyond empiricism is about to be attained. Dr. John Dougall's little pamphlet on the 'Science of Disinfection' claims the discussion of the question as to how far antiseptics can be relied on as antizymotics, and affirms that this supposition is reduced to a palpable paradox, because, as soon as putrefaction is arrested, the zymotic poison is at the same time only rendered quiescent, being, in fact, conserved for future infection. Secondly, that the mineral acids are the true disinfectants, by preventing or arresting putrefaction or transforming it into fermentation, and as being highly antizymotic as regards vaccinine, and therefore *à priori* of other contagion or infecta.

If these conclusions really formed the pith of the matter deducible from this record of Dr. Dougall's latest investigations, as he almost suggests in his recapitulation, it would be doubtful if any great stride had been made towards laying the foundation of the 'science' of disinfection. Fortunately, the opening matter is pregnant with considerations of probably far wider significance, and, if worked out with sufficient care and ability, may lead to the definition of causes and principles which should lay the foundation for a true science.

In calling attention to the fact that the processes of putrefaction and fermentation are not identical, and that this point constitutes the foundation of scientific disinfection, Dr. Dougall has laid down a proposition which either is or is not sound; but it is one which will have to be tested by the light of an experience far greater than is manifest in the treatment of the subject within the covers of the pamphlet. Dr. Dougall is doubtless progressing with his experiments; but neither in the pamphlet, nor in the observations made by him up to the latest date, in debating the point before the Pathological Society, are the distinctive characteristics of putrefaction and fermentation so fully defined as to support this remarkable proposition, even to the extent to which the more advanced knowledge of the nature of these processes is now competent.

It might be thought from these preliminary remarks that I dissent from Dr. Dougall's bold assertion; but, on the contrary, a very special experience in the investigation of these processes leads me to anticipate that it will prove to be well founded. The first postulate assumed is that putrefying matter is very injurious to health, and Dr. Dougall holds that the specific toxic principles of at least typhoid fever and diphtheria are generated *de novo* from putrefying animal matter. To the latter portion of this I must personally decline to subscribe; but, as far as the practice of disinfection is concerned, it is a question of little moment; for whether putrefaction forms the *nidus* for the incubation of foreign poison-germs or these are produced out of itself *de novo*, it is evident that disinfection is required to kill or rob them of their hurtful properties. Dr. Dougall is fully warranted in adducing the abundant evidence to be gathered in every town and village of the injury to health accruing from putrefying organic matter, and he then assumes that 'we have no opportunity of ascertaining the effects of fermenting matter in this respect.' This argues some want of thought; breweries, distilleries, tan-yards, bake-houses, and other centres of industries, wholly worked upon the processes of fermentation, afford the means of studying the influence of vast quantities of fermenting matter on the health of thousands habitually subjected to its emanations.

So far as we yet know, the effect of these trades upon the health of the workpeople cannot be considered injurious as tending to promote or disseminate infectious or contagious poisons. It is therefore favourable to Dr. Dougall's argument, and when we consider the subject of fermentation in its minutiæ it must become apparent that if the emanations of fermentation were productive or disseminative of infection, we could have no hope of immunity from a constant supply of zymotic germs or pathoplasts for eternal epidemics. To support this statement, I have only to call attention to the fact that fermentation of one kind or other is the normal condition of the greater portion of sufficiently moist organic substances as soon as they have lost the life of their development, that these conditions of fermentation depend upon exposure to the action of appropriate gases at certain temperatures, and that putrefaction and decay present entirely different phases of decomposition to those of fermentation; finally that the quantitative ratio of putrefactive action is fortunately by far the least prevalent form of decomposition under ordinary circumstances.

Of the entire mass of organic matter to be found in various forms upon the earth, there can be no doubt but that vegetable organic matter exceeds that of animal matter million-fold. It is equally certain that vegetable matter in the aggregate is composed almost entirely of the carbo-hydrates and water. What is the form, therefore, in which the continual decomposition of these substances chiefly occurs? I have no hesitation in answering vinous, lactous, and acetous fermentation.

The proportion of nitrogenous substances to the carbo-hydrates in the average of easily decomposable vegetable matter is probably not more than 1 to 15 or 20; the quantity of nitrogen capable of elimination would consequently not be beyond the ratio of 1 to 100 parts of starch, gum, sugar, pictine matters, and cellulose. Now, unless a larger proportion of nitrogen be originally combined with some portion of the hydrates of carbon contained in the decomposing matter, it is extremely difficult to set up and maintain putrefaction, except when there is a considerable accumulation heaped together. Experiments tend to show that there is very little real putrefactive action even in moderate accumulations of the less nitrogenous vegetable refuse, and that, as long as there is sufficient constituent moisture, fermentation proceeds to transform the carbo-hydrates into carbonic acid, alcohol, and the vapour of water. It is true that lactous and acetous fermentations are frequently, perhaps, usually, to be traced during uncontrolled vinous fermentation, but lactous fermentation is of itself frequently the main agent of decomposition. After fermentation is exhausted, putrefaction may sometimes be detected, slow oxidation, *i.e.*, true decay, however, commonly completes the molecular change.

Fatty matters promote butyrous fermentation,

but they require a considerable proportion of nitrogen or some of its combinations to decompose them; so much, indeed, that I regard butyrous fermentation as the connecting link between simple fermentation and putrefaction.

There is no need to dwell upon the fact that animal matters are so rich in nitrogenous matter, usually in intimate conjunction with fat and much water, that their almost invariable decomposition by putrefaction points to the obvious conclusion that from this source spring the peculiar modifications of decomposition which give to putrefaction its distinctive characteristics.*

In pointing out for further investigation the great difference in the nature of the decompositions which break up organic matter composed of various proportions of the carbo-hydrates, fat, and nitrogenous substances, I am very solicitous that these proportions may be ascertained within such limits as may, perhaps, define how much nitrogenous matter is required to set up and maintain each of the fermentations, and how small an amount will maintain putrefaction in nearly neutral solutions. I am fully aware that distinct acidity favours fermentation, and that the addition of alkalies promotes putrefaction. The most obvious effect of slight acidity or alkalinity however, is probably due to the production or prevention of certain changes in the nitrogen compounds contained in or in contact with the decomposing matter. On the other hand, the effect of adding strong acids, or alkalies, to organic matter, appears to include energetic action on the vegetable and animal growths which are proved to at least accompany every kind of fermentation and putrefaction.

The influence of extremely minute quantities of nitrogenous matter upon fermentation is seen when yeast cells commence to germinate in a purely non-nitrogenous saccharine solution. In this case the whole of the nitrogenous matter is introduced in the yeast itself; but after a certain amount of action the albuminous constituent of the yeast becomes coagulated and precipitated, and is only found in an insoluble form in the new cells which have been produced during fermentation. Such new cells die for the want of reproductive vitality. A very small quantity of soluble nitrogenous matter in the saccharine solution will prevent the total precipitation of the albuminoid constituent of the new yeast cells, and as long as they retain this their capacity to again excite ferment is not lost. In this manner I have found, from a long series of experiments, that the action of Torula cerevisiæ may be almost nil, feeble, powerful but under control, or, when over-fed with nitrogenous matter, altogether uncontrollable. It is in this latter condition that putrefaction sometimes accompanies vinous fermentations.

The structural difference between the germs and their growths, without which vinous fermentation never proceeds, and the micoderms which produce or evidence the formation of acetous fermentation is not greater than is the divergence of the action of nitrogenous matter in each. Whereas the torula will develop a new growth of cells, although they are effete, in a non-nitrogenous saccharine solution, micodermic germs will not fructify at all except in the presence of foreign nitrogen either in the form of ammonia or of albuminoid matter; the quantity, however, may be very minute.

Lactous ferment and the Penicillium glaucum require much support from the nitrogenous element, and, being usually beyond control except by means of powerful re-agents, may be found to be exceedingly injurious in the vast concentration of the occasional emanations from starch-making, distilling, and other industries of a similar kind. Scattered broadcast in the open air, the lactous fermentation of very large quantities of grain and other vegetable matters gives no appreciable fetor, and may presumably be considered as free from sanitary objection.* Even in its most virulent form, the intolerably disgusting final decomposition of rice and distillers' wash has not been proved to incubate or disperse zymotic poisons, and, if it could be so traced back, I should expect to find that in any such rare instance the lactous ferment had changed to putrefaction. Here I would observe that the much larger proportion of nitrogenous matter necessary to sustain lactous ferment renders the supervention of putrefaction a more likely contingency in the residue after lactous change than is reasonable to anticipate in the bi-products of vinous or acetous fermentation, in which no large amount of lactous transformation has been set up.

Butyrous ferment requires neither air nor oxygen; but nitrogen in considerable quantities is an essential at common temperatures. In this respect, and in another to which I shall have to allude, butyrous fermentation may be classed as being between pure fermentation and putrefaction, or rather as partaking of the essential characteristics of both.

Until arriving at this grade of fermescence, the germs and growths attending the vinous, acetous, and lactous changes of organic matter have been almost universally admitted to be of vegetable life; and there are several other ferments of very minor importance which must be classed with them. In butyrous fermentation, however, both vegetable and animal life may be observed. An alcohol is evolved, as in all the preceding fermentations; but in this it is accompanied by the presence of animalcules (monads or mycrophymes).

If, as is probable, one great distinction between pure fermentation and putrefaction consists in the attendant or excitant presence of living vegetable growths in the first, and in the co-existent diffusion of animalcules in the second, the dual nature of butyrous ferment is as much evidenced by the evolution of alcohol from matter teeming with animal life as it is by the necessarily large proportion of nitrogen in its constituents, this not being sufficiently great to engender or support the higher living organisms of advanced putrefaction.

In tracing up the increased proportions of nitrot genous matter required to support the differenl conditions of fermentation until it is found equato the sustentation of the lowest forms of animal life in butyrous ferment, it only remains to ascertain that a still greater equivalent of nitrogenous matter is necessary to develop the vibrios and their cell segments, bacteria, amœbæ, etc., coming under the generic term of mycrozymes. These are the evidences of putrefaction in which alone we have as yet any evidence of direct propagation or incubation

* It is by no means intended to suggest that the nitrogenous constituents of animal matter are more prone to putrefaction than those of vegetable origin, except that they are more easily soluble.

* An exception must be made in all cases where the decomposition of large quantities of vegetable matter occurs on stiff, undrained clay or marsh land. It is then productive of malaria engendering ague and other intermittents.

of infectious or contagious poisons. That highly nitrogenous matter is prone to putrefaction, no one denies; that sufficient dilution of such matter even in a state of putrefaction will render it harmless by oxidation must be accepted; but that the specific toxic principle or germ of choleraic or enteric excreta can be rendered innocuous by the most excessive dilution in water, no one with the experience of the last few years can for an instant believe. It may be that direct personal use of such water is required to instil the insidious poison, but it is equally in evidence that the gaseous emanations and floating particles disseminated by the accumulation of putrefaction does produce or predispose towards the inception of infecta and contagia. We have, therefore, to determine, first, the smallest proportion of nitrogenous matter which commonly decomposes by putrescence; then, the accumulation of putrefactive matter, exposed to the air, on the ground, or suspended, or in solution in water, which by analogy or experience has conduced to the propagation of infection or contagion, and we shall have advanced two most important stages towards what is required to give substantial data upon which to base the 'science of disinfection.'

I wish to assume that the absolute destruction of all excretal specific poison germs is the first necessity of disinfection. Choleraic and enteric stools, desquamations from small-pox, scarlet fever, and the phagedenic discharges of ulcerous wounds must be immediately treated with the most powerful reagents so as to entirely prevent the possibility of re-infection or post-contagion.

The passing of choleraic or enteric excreta into the drains without being perfectly disinfected should be held to constitute a crime of the most heinous magnitude, and the neglect of a thorough and proper disinfection of the clothes and other articles liable to spread contagion cannot be regarded in any other light. The absolute purification of the air of infected rooms, or of the emanations from putrefying matter when floating in the atmosphere, is probably beyond the scope of science, but we can ameliorate the air in sick rooms by oxidation and deodorisation, or even by substitution, and we can prevent by far the larger portion of putrefactive emanations by suitable treatment of the putrefying matters.

This latter process can never be accomplished after the admission of the excreta into the sewers worked upon the water-closet plan, neither can it be accomplished economically in cesspools or catchpits through which the whole of the domestic drainage passes. But if none but the urinous slops and the excreta, washed down with the minimum of water, were to be adequately and universally treated, the poisonous emanations of sewer-gases would be rendered innocuous. The inspectors of nuisances should then become responsible that no putrefactive matters of any kind should be permitted to be thrown into any place not authorised by the officer of health, and within a certain distance of habitations. It should be equally incumbent that any putrefying matters should be disinfected before being cast out.

So many objects have to be attained before what is generally comprehended within the term disinfection can be considered complete, that it is hopeless to expect to arrive at the desired result by only one means. Specific poison germs have to be annihilated in the dejections of zymotic disease, the clothes and other articles have to be treated so as to permanently stop infection and contagion without destroying their textures. The ordinary excreta require general disinfection, and putrefaction in all other organic accumulations within a certain distance of habitations, must be arrested. The gaseous effluvia of noxious matters, even if not probably infectious, demand purification, and the atmosphere of hospitals and sick rooms should be rendered as sweet and agreeable as the power of science and the force of ingenuity can suggest. Hence there is scope for a multiplicity of disinfectants, of methods of disinfection, and of antiseptics. We require now, more than ever, the purifying influence of oxidising agents, of deodorant, and of substitution products, to sweeten and make pleasant the fetid and depressing results of bad ventilation. I shall next endeavour to consider the action and relation of some of the best assured of those now before the public in connection with the particular phases of the subject for which experience points out that they are specially adapted.

HOUSEHOLD STORAGE OF WATER.

NOTHING can possibly be of more consequence to a household than a sufficient supply of pure water, and were we all as liberally supplied with this element as the people of Glasgow, the general gain to public health would be simply incalculable. But it is not alone important that the supply should be adequate in quantity, and it is equally material to observe that the water be stored in proper and suitable cisterns. This is a matter not sufficiently ventilated in sanitary circles, and we are all left to the freedom of our own wills as to the adoption of leaden receptacles. All should be, however, aware that water stored in leaden cisterns, or in wooden tanks lined with lead, soon becomes unfit for potable purposes, and that much sickness has been traced to this practice. We are not all similarly susceptible to the action of this metallic poisoning, and the dangerous dose may, in some instances, not exceed the fortieth part of a grain to the gallon, whilst others may with impunity imbibe water containing a tenth part of a grain. Science is, however, now satisfied that water contaminated with more than the twentieth part of a grain is risky and unsafe to convey into the system.

The same danger to health and life accrues, whether the water so stored in leaden cisterns be soft or hard, and so careful ought we to be under this head of lead-taint, that water which falls upon roofs on which a lead superfices predominates, as on many leaden flats, should always be looked upon with suspicion. A dangerously high proportion of lead might even be discoverable when water, before passing into the tank, falls upon ordinary lead flushing and upon leaden rolls, hips, and valleys, since it bears with it in its rush cistern-wards the deleterious oxidations which have accumulated upon their surfaces since the last down-pour. Lead may therefore be considered as an improper material for cistern-lining in every case where the water is usable for culinary purposes. One of the chief reasons why their use is persisted in is because of the ease with which they can be constructed in roof spaces and in the holes and corners of houses, since the wooden framing can be put together *in situ*, where the finished tank could not be taken, and the lead lining dressed in after the wood casing is constructed. And whilst upon the head of leaden receptacles for water, we

ought perhaps to add that it is the duty of every householder to examine his water-tanks and to see of what material they are built. People are very culpable on this head, and not until the physician has been called in is the source of disease made palpably manifest to their senses. It is with a view of benefiting householders that we pen these few remarks, and we have no hesitation in saying that the only place in which a lead cistern may be made reasonably available in a house is in connection with a water-closet, or when the water contained in it is merely used for flushing purposes.

Having discarded lead as a cistern material and indicated its unsuitability for the storage of potable water, we will add a few words as to the best kinds of cisterns to be adopted in residences about to be built, and what is the same thing, in existing houses where lead cisterns are very properly about to be abolished. Unfortunately, or it may even be fortunately, there is not much choice, but what choice we have lies amongst cheap and not necessarily expensive media. Where bulk, or a little extra heaviness be not an objection, a very suitable material is found in slate. Some architects always specify plain slate cisterns for kitchen, scullery and general culinary uses and enamelled (inside) slate tanks for purely drinking purposes. These latter should be fixed, however, high enough to be available for the filling of the bed-room decanters, as otherwise they are certain to be filled by way of the taps at the housemaid's sink, which is invariably, or nearly so, in connection with the leaden cistern over the closets.

The chief objections hitherto made to slate cisterns are their bulkiness, weight, and liability to leak, should a settlement of any kind take place in the roof or walls upon which they sit; but really these objections are none of them insuperable, and can easily be provided against. In ordering a slate cistern, we may with profit to our readers add that mistakes are often made from an ignorance of the fact that, unless otherwise specified, the dimensions are taken at the slate-works as external ones; the first set of figures as indicating the length, the second the width, and the third the depth. It might be as well to know also, that cisterns requiring slabs over six feet in length or three feet in width, or with more than five slabs in their construction, are subject to special prices, for evident reasons. The best slate cisterns, too, are invariably grooved and fitted with iron cramping bolts, which are sometimes galvanised. Nothing of metal, however, necessarily comes into contact with the water.

There is one convenience connected with a slate cistern which is greatly overlooked, and that is the facility with which filtering compartments can be fitted up in them. The water from a larger cistern can, for instance, be led into a smaller one of slate, and made to pass through two or three filtering compartments filled with sand or other suitable material. By this means the water collected on the roofs or elsewhere can be purified from the droppings of birds, from soot, decaying leaves, dead insects, and partially from lead poison, and be made a most useful addition to the butler's pantry, laundry, and even bed-room, since any number of pipes can be carried out of the pure compartment. Such filters are the very essence of cheapness, and by their aid there is no reason why the water given to the very animals in the cow-houses and stables should not be filtered with valuable results. The slate filters are also made portable, and enamelled inside for domestic use. In each case the water is filtered on the ascending principle.

We do not think it necessary to take into our present consideration the tanks made up of cast-iron pieces, though many of them are still constructed for huge establishments, as a first receptacle for pumped-up water—the other cisterns in the house and offices below being filled in detail from them. Cast-iron tanks will never be made available now as small cisterns, whatever may have been originally predicated of them, for wrought-iron ones are now so cheaply riveted together. In consequence of our improvements in the rolling of iron, what are called galvanised iron tanks have come into general use, and there is no doubt that they perform useful work. These are simply wrought-iron tanks cleaned out by dilute acid and dipped into a bath of molten zinc. They can be made of any size, from ten gallons up to ten thousand gallons capacity, only in the latter case the galvanised portions are built up in sections, and tied inside with cross boltings.

Many persons of late years have been labouring to prove that water which has been stored in cisterns of galvanised iron is dangerous to health. But this vexed question has been set at rest so far, that it has been proved that the oxide of zinc, as it occurs in drinking-water, is quite harmless, and that a verdict of equal innocuousness can be given in the matter of the carbonate of this metal. Even the sulphate and the chloride of zinc, which are the most active poisons of the salts of zinc, are quite innocent when they occur in drinking-water. Were all the zinc in solution of the chloride form—and that is the acrid and corrosive form, the amount would still prove harmless to the system. It is impossible to estimate the benefit which is thus secured to us; for, unquestionably, if it had been proved that the galvanising of iron had caused it to act deleteriously as a storer of water, the loss to the community would have been incalculably serious. Indeed, we know not what we could have resorted to, unless to our ancient temporary makeshifts.

There is not much advice to be given in the choice of a galvanised iron cistern, but it would be well to bear in mind that all waters are more or less impure, and being so, exert a certain wasting action upon the zinc which lines the cistern. The lining metal is thus gradually removed, and the bared material or the iron exposed, which speedily becomes rusty and scales off. A galvanised iron tank should therefore be properly galvanised, and those firms only had recourse to who can afford to use spelter which will run evenest upon the surface of the iron, and best incorporate with its skin. We have seen tanks the zinced lining of which perished in a few months. It is true that the zinc will disappear in time, but it need not vanish during the first year. For the rest, place the galvanised iron cisterns where they can be got down again and sent to be once more submitted to the dipping process.

THERE is a common belief that children must all 'go through' measles, whooping-cough, and other 'childish complaints,' just as dogs must go through the distemper. The opinion is a very ignorant and mistaken one, and is often both an excuse for, and a cause of, much neglect. It was strongly combated by Dr. Saunders, medical officer of the Middlesex and Hertfordshire Combined District, in a paper which he read lately at the Herts Medical Society, from which we propose presently to publish extracts.

THE
SANITARY RECORD.

SATURDAY, NOVEMBER 13, 1875.

TO SECRETARIES OF SANITARY ASSOCIATIONS AND KINDRED SOCIETIES.

The Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers read before the members of any sanitary or kindred association.

GREAT QUESTIONS OF PUBLIC HEALTH AT THE BRUSSELS CONGRESS.

Prevention of Cholera—Reform of Public Maternities—The Matchmakers' Disease.

AMONG the prominent questions discussed at the recent International Congress, at Brussels, at which the King of the Belgians and the Minister of the Interior were present, were some great questions of public health.

The question of the prevention of cholera was foremost on the list; and on this subject the Congress arrived at the following conclusions.

Prevention of Cholera.—I. The prophylaxis of Asiatic cholera should be based on as complete as possible an etiological idea of the disease.—II. Cholera is a specific disease; that is to say, it is produced by a morbid principle which is always alike, and it cannot be produced by other causes.—III. The essence of the cholerigenic principle is unknown to us, in the same way as is the generating principle of small-pox, scarlatina, etc., but we possess very important information from the prophylactic point of view with regard to its origin, attributes, and the laws of its propagation and solution.—IV. Origin. The cholerigenic miasma is spontaneously developed in certain countries in India, notably the Delta of the Ganges, and the flat lands which surround Madras and Bombay. Springing from these original foci, it has migrated on different occasions to Europe, Africa, and America, constituting those different epidemics still within our memories. However, since these great epidemics, more limited explosions of Asiatic cholera have occurred. It is a question whether these explosions are due to the spontaneous production of the cholerigenic miasma on the European soil, or if they must be attributed to the slow development of miasma, left as it were in reserve by the preceding Asiatic epidemic. This last is the opinion most generally adopted; but, however it may be, it is none the less true that the Indian cholera can acclimatise itself in Europe.—V. Attributes of the cholerigenic miasma: 1. This miasma becomes regenerated in the subjects attacked by cholera, and is hence transported to healthy individuals, in whom it induces the development of the disease; in other words, the cholera is essentially contagious. 2. The cholerigenic miasma behaves after the fashion of soluble and volatile bodies; thus, it becomes dissolved in water, diffuses itself in the atmosphere, where it remains in a state of homogeneous diffusion; that is to say, without accumulating in the sloping points. 3. The morbific power of the cholerigenic miasma is less powerful and fatal in its action than other known miasmata and viruses. 4. It is not very lasting, and appears to be very easily destroyed, especially when the air is strongly ozonised. However, in certain confined conditions, sheltered from the air, it may last a long time. 5. The miasma is destroyed by a high temperature (1,000° and more) and by a certain number of chemical agents with powerful affinities. This question calls for further study in order to arrive at a really practical precision and clearness. 6. Persons exposed to the action of cholerigenic miasma acquire after some time a kind of acclimatisation to it which protects them from the disease.—VI. Laws of the propagation of Asiatic cholera. The choleraic contagion is seated principally, perhaps exclusively, in the ejections of the patient (matters vomited, and especially intestinal evacuations). 2. It may be communicated from the sick person to healthy individuals by different vehicles, amongst which, after the ejecta, may be noted the patient, the corpse, the body linen and clothes worn by the cholera patients, the rooms, ships, or carriages of which they have made use, the latrines, water which may have been contaminated by choleraic ejecta, the air at a short distance only; animals and merchandise which may have become impregnated with cholerigenic miasmata.—VII. Choleraic impregnation and evolution. 1. The cholerigenic miasma penetrates chiefly by the pulmonary and digestive passages. 2. The duration of incubation is generally very short. 3. Mental and hygienic conditions of a depressing nature favour the evolution of the choleraic poison.—VIII. The prophylaxis of cholera takes its rise from the following etiological ideas. The first indication is to destroy the original foci of the cholera in India and its secondary foci in Europe by sanitary works. The second maxim is to prevent the transport of the morbid principle into healthy countries by all really efficacious plans of isolation compatible with the exigencies of modern civilisation. The third prophylactic rule is to neutralise this principle by methods of disinfection still to be determined. The fourth precept consists in diminishing the ravages of cholera by well considered hygienic measures. Finally, the Congress hopes that the great sanitary works undertaken by England in India will be satisfactorily terminated, and will succeed in stamping out the Asiatic epidemic in its original home. The

section admitted these conclusions with almost perfect unanimity. They are, in fact, the reproduction of those arrived at by the Vienna Congress in 1874. It will be observed that in these conclusions the word 'quarantine' is replaced by 'measures of isolation;' in fact, MM. Jaccoud, Sigmund of Vienna, and Semolla of Naples, have condemned the system of quarantine now in operation.

Reform of Public Maternities.—The melancholy fact that the mortality of childbirth is enormously greater in hospitals than in the homes of the lying-in women, however poor, has long been established in this country, and there are not many hospitals of the kind here in active existence. Maternity charities in Great Britain are mostly out-door organisations; abroad great maternity hospitals still flourish, as they do in that great but very dubiously useful establishment, the Rotunda hospital at Dublin. The conclusions of the Brussels Congress were strongly and unanimously against the continuance of lying-in hospitals. We believe that it can be clearly established that all lying-in hospitals in this country or elsewhere are curses rather than blessings to the communities among which they exist. The following were the resolutions adopted: 1. There is urgent need for a radical reform in the system of assistance to lying-in women. 2. That complete abandonment is called for of great maternities. 3. Great maternities should be replaced by small houses of accouchement with separate chambers, with schools for midwives and for instruction. 4. Home attendance on poor lying-in women should be increased as much as possible. 5. Whenever the resources of a city permit it, and especially in case of any epidemic in a lying-in institution, it is desirable that homeless women should be sent for accouchement to the domiciles of public midwives.

The Matchmakers' Disease.—The frightful disease known as 'matchmakers' disease of the jaw,' which attacks workers in phosphorus, is one of the opprobria of civilisation. In this fearful disease the bones of the jaw are eaten away by a gangrene, due to the action of fumes of phosphorus. It is wholly prevented by the use of a kind of phosphorus known as 'red or amorphous phosphorus,' such as is, we believe, in use at Messrs. Bryant and May's factory for 'safety matches.' Such a disease now implies carelessness, little, if at all less than criminal. None other but amorphous phosphorus should be used, and the use of the old and dangerous form of phosphorus should be forbidden. On this subject the Congress adopted the following conclusions:

The section of medicine would like to see the use of red amorphous phosphorus substituted for that of common phosphorus in all match factories. Until this radical reform shall be universally adopted, they recommend in the present state of the manufacture the following measures, which are intended to prevent general toxic accidents, and more especially necrosis of the maxillary bone. Location of the factory in sufficiently spacious localities, thorough ventilation obtained by means of air-tubes set in the ground, and leading into an exhausting chimney; also the greatest and most constant attention to cleanliness. In conjunction with these prophylactic measures, the use of essence of turpentine will be found useful as a chemical antidote. Local affections may be removed by astringent gargles, and especially by the obligations imposed on manufacturers not to admit into their workshops any workmen in whom a preliminary examination has shown that the teeth are affected by penetrating caries or any other affections likely to favour the hurtful action of phosphorous vapours. Children cannot be employed in workshops where phosphorus is manipulated. When the authorities allow the establishment of manufactories where this substance is manipulated, they ought to impose these conditions, and insist on their being performed, as much in the interests of the workmen as of the manufacturers, who are responsible to the law for misfortunes, owing either to their heedlessness or negligence.

MYSTERIOUS LIQUORS.

IN the last quarterly report of Mr. A. G. Anderson, analyst for Poplar, he says, 'The causes of the peculiarly intoxicating effects of porter cannot for one moment be supposed to result from the almost minute and surprisingly small amount of alcohol (spirits of wine) I find contained in that class of beer; yet a quart or two of it will produce more decided drunkenness than brandy or whisky containing twenty times the amount. I am sparing no efforts to find the nature of the substances which exercise this remarkable action,' etc.

It appears from this that, although Mr. Anderson is unable to detect any adulteration in the ale and porter in the Poplar district, he still thinks that adulteration is practised by a large body of traders, and the ground upon which he founds this supposition is that the remarkable physiological effects produced by ale and porter cannot be accounted for by the 'almost minute and surprisingly small amount of alcohol' contained in these beverages. Now we can assure Mr. Anderson, from our own experience, that he will save himself a great deal of trouble in his search for the intoxicating ingredients other than alcohol, if he will first examine his samples more carefully for the latter. It having fallen to our lot to

Number of samples.	Price per quart.	Alcohol, per cent.		
		Lowest.	Highest.	Mean.
16	3*d.*	3·6	7·0	4·6
31	4*d.*	3·8	8·4	5·6
28	5*d.*	3·8	7·9	6·0
24	6*d.*	5·5	8·0	6·7

examine a considerable number of samples of ale and porter as sold over the counter by publicans in

various parts of London, we are in a position to speak with some confidence on the matter. The results found by us are given in the table.

As the brandy and whisky sold under similar circumstances contain only from 30 to 40 per cent. of alcohol by volume, it is obvious that a person who drinks two quarts of fourpenny ale or porter consumes more alcohol than is contained in half-a-pint of brandy or whisky. When intoxication results under such circumstances, it should not be very difficult for Mr. Anderson 'to find the nature of the substances which produce this remarkable action' without supposing a fraudulent addition of foreign intoxicating agents of so mysterious a nature as to puzzle, 'not only chemists, but those of the Inland Revenue who from long experience ought to know all about it.' Mr. Anderson appears to have adopted the fallacy so general among people who have been intoxicated, that they were not drunk from having taken an excess of liquor, but from the fact of the drink being adulterated. We believe it will be found almost universally the case that the evil lies more in the quantity than in the quality.

In our opinion the principal adulteration of ale and porter practised in London consists in the addition of sugar or treacle and water, and we presume Mr. Anderson will not pronounce one or other of these as possessing any mysterious intoxicating property.

Notes of the Week.

MR. ROGER FIELD, C.E., has been appointed sanitary engineer to the town of Uppingham.

TWENTY-ONE different schemes for the preservation of Epping Forest have been laid before the Epping Forest Commissioners.

THE Poor Children's Dinner Table Society of Glasgow last year supplied 90,000 dinners at a total cost of 738*l.* 14*s.* 5*d.*

A MEETING of ratepayers has been held, and a resolution passed, to form a local board in the parish of Sheepshed, Leicestershire.

THE number of persons committed in England and Wales last year who could neither read nor write was 53,805, of whom 35,479 were males and 18,326 females.

TYPHOID fever has appeared at Caldecott, a village to which a servant of one of the masters at Uppingham School was sent home, whilst suffering from that disease.

LAST year there was a large increase in the number of prison punishments, the total number inflicted on males and females was 56,932, being an increase of 2,602 on the previous year.

MR. J. BEATTIE, the late chairman of the East Molesey Urban Sanitary Authority has been presented with a valuable time-piece, etc., in recognition of his long and able services.

SIR JOHN BENNETT'S gift to the London School Board of twelve silver watches, for the encouragement of swimming, has been handed over to the London Schools Swimming Club.

THE Local Boards of Bedford, Pennington, and Westleigh, Lancashire, have been dissolved by Provisional Order of the Local Government Board, and constituted the Leigh Local Board.

THE ratepayers of Belper have made a requisition to the churchwardens to call a public meeting for the purpose of adopting the Public Health Act, 1848, or the Local Government Act, 1858.

A GOVERNMENT inquiry has been held by Col. Ponsonby, R.E., with a view to the promotion of a combined system of sewerage for towns and villages in the Thames Valley. A scheme by Sir Joseph Bazalgette, to deal with an area extending over 100 square miles, was put forward by the commissioners.

IT was reported at the annual meeting of the English Channel Steamship Company, that though the *Castalia* was not a financial success, owing to inadequate speed, she had solved the question of immunity from sea-sickness during the channel passage. The meeting resolved to have another vessel built on Captain Dicey's principle.

A PUBLIC meeting, at which about 3,000 persons are estimated to have been present, was held upon Hackney Downs on the 8th inst., to protest against the threatened enclosure of this portion of the Metropolitan district. Resolutions were passed, one calling upon the Metropolitan Board of Works to carry out the provisions of the Commons' Act of 1871, and so preserve Hackney Commons for the use and recreation of the people; another, inviting the borough members to be present at a second meeting, to be held the Sunday after next.

THE Wednesday evening papers to be read at the Society of Arts before Christmas, include the following: December 1.—'On the Legislative Enactments requisite for safe Conduct of Sewage Grounds.' By Alfred Smee, Esq., F.R.S. On this evening Henry Letheby, Esq., M.A., M.D., will preside. December 15.—'Health, Comfort, and Cleanliness in the House.' By Thomas Blashill, Esq., A.R.I.B.A. A series of reports has also been prepared by Dr. Richardson, appointed by the council to make special inquiry into the subject of 'Unhealthy Trades.' These will be delivered in the form of lectures on Friday evening in December, January and February.

MILK FRAUDS.

WE are glad to see that some convictions for selling adulterated milk are still possible under the new Act, although it will be undoubtedly much more difficult to obtain them, since the fraudulent vendor of impoverished milk can now plead, 1st, That he sold the milk as he received it; 2nd, That he could not, with reasonable diligence, ascertain that it was adulterated; 3rd, That it is 'impoverished and not adulterated.' Reasonable diligence will, we trust, be held to imply that the specific gravity (corrected for temperature) and the amount of cream, taken with the creaming glass, did not together indicate that the milk was falsified. Every milk vendor should be bound to keep a register of these sets of figures, which may be easily obtained by five minutes' labour, and are not above the comprehension of an ordinarily instructed child. Failing such an examination of the milk which he buys, a milk-vendor cannot be held to have exercised reasonable diligence.

There is a great disparity between the fines inflicted. In one case the magistrate righteously fined the vendor 20*l.* In another case another magistrate let off an offender of much the same class with a fine of 12*s.*, a very small per-centage on his daily profits.

SCHOOL-BOARDS AND PRISONS.

THE Rev. D. Morris, Protestant chaplain of the Liverpool Burgh Gaol, reports a remarkable decrease in the number of juvenile prisoners, which he attributes to the action of the School Board. The reverend gentleman remarks that nearly all the children of school age who come under his care have never attended school.

TYPHOID AMONG ANIMALS.

A PARAGRAPH in the *Times* states that a most fatal disease has appeared in several districts in both Ridings among pigs. Many believe it to be typhoid fever, and as such it is reported. It is most fatal in its effects. What is 'typhoid fever' of pigs? Has it any relation to the similar disease in man? Can any of our medical officers of health or sanitary inspectors throw light upon the subject?

BATHING AT HAMPSTEAD.

AT a late meeting of the Hampstead Vestry, the question of providing a safe bathing-place, instead of the pond on the Lower Heath, which is notoriously dangerous, came before the meeting. Reference was made to the unfortunate death of Mr. Sherrett, jun., and it was stated that about 1,600 persons bathed daily in the pond where he was drowned. It was resolved that the vestry should memorialise the Board of Works requesting their co-operation to secure another pond on the heath more suitable for bathing purposes.

COMBINED DRAINAGE.

THE plan of combined drainage has been adopted at Nottingham. The town contains about 100,000 inhabitants, and is surrounded by numerous populous suburbs, all of which, with the town, lie more or less upon the banks of the river Trent, and its tributary the Leen. There being a number of villages round about not properly drained, the whole has been massed into one district for sanitary purposes, and a system of drainage established throughout. The great feature is an intercepting sewer, six miles in length, so that the Trent will no longer receive the sewage of the locality.

COAL-CUTTING MACHINES.

THE well-known coal-cutting machine, patented by Messrs. Frith and North, has just formed the subject of a petition to the Queen in Council. The question whether the letters patent should be prolonged or not was considered by the Judicial Committee of the Privy Council on the 3rd inst. It was shown for the petitioners that great opposition had been shown by colliers to the machine, and they had even gone to the extent of offering up prayers at local prayer meetings for its confusion, consequently the petitioners had not been sufficiently remunerated. The committee took this view, and prolonged the patent for seven years.

THE ORIGINATOR OF CRECHES.

MR. CAMPBELL DE MORGAN, F.R.S., writes:

SIR,—In the RECORD of Nov. 6, I see noticed the death of M. Marbœuf, 'the originator of *crèches*, or infant nurseries.'

The following quotation is from the curious *Budget of Paradoxes*, by my late brother. 'At Amiens, at the end of the last century, an institution was endowed by a M. de Morgan, to whom I hope I am of kin, but I cannot trace it; the name is common at Amiens. It was the first of the kind I ever heard of. It is a *salle d'asyle* for children, who are taught and washed and taken care of during the hours in which their parents must be at work. The founder was a large wholesale grocer and colonial importer, who was made a baron by Napoleon I. for his commercial success and his charities.' Here, I take it, we have the first introduction of the principle of the infant nursery.

MEDICAL RELIEF AND PAUPERISM.

IT has been before pointed out that the medical relief statistics show that efficient medical relief, by arresting the beginnings of pauperism, has done much in Ireland to diminish the amount and proportion of expenditure upon relief generally. Recent figures show further progress in this direction. From a Parliamentary paper lately published, we learn that the amount of medical relief in Ireland during the decade of 1864-74 has decreased from 888,835 cases to 687,165, being a decrease of 201,670. There has been an increase, however, in the cost of medical charity, the amount expended in 1874 being 140,922*l.*, against 117,048*l.*, or an increase of 23,874*l.*; during the same period, the vaccination increased from 131,426 to 139,587 cases.

LONDON ALE AND PORTER.

WE would call attention to the brief statement which we published of the results of 119 separate analyses of samples of ale and porter, sold over the counter by publicans in various parts of London. They show such a percentage of alcohol that it is obvious that a person who drinks two quarts of fourpenny ale or porter consumes more alcohol than is contained in half a pint of brandy or whisky. This will, no doubt, astonish a good many people who are apt to think a couple of quarts of ale a-day quite a moderate allowance, and when they find intoxication from beer among the lower classes so common, are apt to attribute it to some mysterious adulteration of beer and ale. We have excellent reason for stating that the main adulteration of ale and porter practised in London is the addition of sugar or treacle and water, and the lamentable frequency of intoxication is mainly due to excess of quantity rather than to defect of quality in beer.

DUBLIN MAIN-DRAINAGE WORKS.

AT a special meeting of the corporation, on the 8th instant, a letter was read from Sir M. Hicks-Beach, announcing the decision of the Government respecting the loan of half a million, sought for the main-drainage works. The Public Works Loan Commissioners, it appears, consider that the amount required to be raised by assessment for the payment of the loan involves the levying of unusually heavy rates, and therefore deem the security offered insufficient, and that the additional security contemplated by the 38th and 39th Vict. should be provided. After a long discussion it was resolved that the Government should be informed that the corporation could only give the security required by extending the city rating to the suburban districts, which would involve a protracted legal contest. The Kilmainham township have selected a drainage scheme of their own, which would discharge all their sewers into the only moderately clean part of the Liffey, that at Kingsbridge, and it was unanimously resolved to oppose it.

PARTING WITH AN OLD FRIEND.

NO amount of evidence seems to carry conviction to some minds. This was exemplified at a recent meeting of the City Commissioners of Sewers, when Mr. W. Clements supported the adoption of Dr. Sedgwick Saunders's report recommending the closing of the City pumps. He took occasion to remark that, though the report showed that the water from Aldgate Pump contained a quantity of sewage which was decidedly injurious to health, he knew many of his friends had an affection for the pump, and had an objection to its being closed. This observation was immediately illustrated by Mr. Innes, who proceeded to argue that some of the matters reported to have been found in the water of Aldgate Pump—lime and magnesia—were simply proper constituents of pump-water, wisely ignoring the ammonia and albuminoid matters. However, the meeting did not seem convinced by Mr. Innes's arguments, and came to the conclusion that the pumps should be closed, and that Mr. Innes must seek his lime and magnesia at other and more legitimate sources.

DIMINUTION OF ADULTERATION.

AT a meeting of the Greenwich District Board of Works on October 27, Mr. Wigner, the district analyst, presented a report in reference to the Act of 1872, during the two years in which its provisions were enforced in the district, showing that 454 samples had been analysed, of which fifty-five were proved to be adulterated. During these two years the food of the people had unmistakably improved in quality except in the article of milk.

ILLICIT DISPOSAL OF INFANTS.

THE *British Medical Journal* after discussing minutely all the aspects of the Southampton case, and the many legal and social difficulties which surround the disposal of the bodies of still-born infants, suggests the following remedy:

'But is there a remedy? We think there is, and it is this. In every parish there ought to be a mortuary, which, besides affording shelter for all bodies found in the streets or elsewhere, should be a receptacle for the bodies of infants awaiting burial. These might be removed periodically to the cemetery or burial-ground. The burial fees ought to be uniform throughout the kingdom, and all infants under a certain age, say seven days, should be buried for the same fee as a still-birth. By thus affording people facilities for removing from their wretched homes, which often consist of one room only, the body of an infant till such time as they can raise means for its burial, and removing this utterly senseless pecuniary distinction between burying still-births and dead infants, which are seldom larger, and often much smaller, the principal inducement to fraudulent and secret burial would be removed.

'It should be made a misdemeanour to bury any body, whether of a still-birth, deceased child, or adult, in any but a public burial ground. Possibly the undertaker at Southampton may have been guilty of obtaining money under false pretences, but if so, this is an accidental circumstance, and quite apart from the irregular and indecent disposal of these bodies under the floor of his shop, for which there is only too much reason to fear that there is no penalty.'

THE ARTISANS' DWELLINGS ACT.

THE medical officer to the vestry of St. Martin's-in-the-Fields, Mr. Skegg, recommends that, under the provisions of the Artisans' Dwellings Act, Bedfordbury and the contiguous courts should be demolished to make room for proper and healthy houses. His report shows a state of things in the forty-seven houses forming the narrow street known as Bedfordbury which would hardly be surmised from the comparative decency of their exteriors. The description is but a reiteration of the unwholesome conditions under which but too large a proportion of our working population is condemned to live, and which the working of that most useful measure, the Artisans' Dwellings Act, seems likely in great measure to remedy. Dark staircases, worn and broken stairs rendering the passage up and down positively dangerous; unventilated closets situated in dark and confined situations, are noted in Mr. Skegg's report as characteristics of the forty-seven houses doomed to demolition. Frequently the same cistern which supplies the closet is used for drinking purposes also; a most ingenious plan for engendering and diffusing typhoid fever. One house is occupied by thirty-three people living in six rooms. On the first floor the two rooms are occupied by two families, numbering respectively seven and two; on the second floor the two rooms are tenanted by two families, respectively five and seven; and the third floor by two families of six and six. Another house is occupied by thirty-six people living in nine rooms. In one room there is a family of six, and in another a family of seven.

An important scheme, under the Artisans' and Labourers' Dwellings Act, has also been adopted by the Swansea Town Council. About 1,753 persons will be ejected, and the council intend to provide for them by erecting model dwellings. The cost of the scheme is estimated at 61,288*l.*; but, as the improvements will give a splendid thoroughfare through property of little value, the assessment will be raised, and the council will gain 800*l.* a year in rates—thus reducing the original outlay considerably.

THE NUNHEAD RESERVOIR.

THE residents in the neighbourhood of Nunhead are just now more or less in a state of panic, owing to the withdrawal of the resident engineer from the official residence close to the new reservoirs which have been built upon the top of the hill overlooking Nunhead. These reservoirs have been built to accommodate some 18,000,000 gallons of water, and it is feared that without proper supervision, more especially when first filled, that some accident may happen, and the water flood the lower portions of the district. The inhabitants are the more uneasy since it has transpired that whilst in course of construction some rather serious landslips occurred at one corner of the main reservoir, necessitating careful underpinning, and also the obliteration of some springs which oozed out at the wrong places. Nor are they altogether satisfied that even when the water has been led into the reservoir, that a new Holmfirth, Sheffield or Bury catastrophe may not accrue, and devastation befall both life and property. Undoubtedly were the walls to give way when the reservoir was charged with water all this would happen, and it is in order to guard against uny undue strain upon the newly completed works that the inhabitants of the districts beneath it demand at the hands of the Southwark and Vauxhall Water Company, that the engineer who carried out the details of this gigantic structure should reside on the spot and see to it efficient maintenance. We consider the request but a reasonable one, and that the water company should fall in with the wishes of their future customers. There can surely be but little inconvenience following the protracted residence, if only for a few more months, of the engineer, who is practically responsible for its structural completeness, and it would be a graceful concession to a not unreasonable feeling of dread. The public are not all engineers, but they know that, although the pressure of the water near the top requires but an inconsiderable resisting surface, the deeper the reservoir is the pressure increases in proportion, and renders necessary a corresponding extra strength in the foundations and retaining walls.

HOUSEHOLD SOURCES OF INFECTIOUS DISEASES.

A PAPER with this title was contributed to the Social Science Congress at Brighton, by the indefatigable sanitary reformer, Mrs. Baines. The authoress attacked that old nuisance, the dust-heap, as it is allowed to exist in most houses, and showed that it usually contained not only the legitimate cinder-ash from fireplaces, but also decaying vegetable refuse and other matter, which deteriorated the value of the cinder dust, produced consequent loss to the dust contractor, and—a more serious evil—was often allowed to remain in the dustbin until it became a fever-nest and pernicious to the whole neighbourhood. Cinders often formed a valuable part of what was thrown away as waste. They should be separated from the ashes by a wire grating or sieve, and re-consumed; whilst nothing liable to decomposition should ever be allowed to rest in the dustbin. Mrs. Baines also attacked the pig-tub system of modern households, by which masters and mistresses were greatly robbed, invalids and children deprived of the necessary elements of nutrition in their food, and the basements of houses converted into fever-nests. Periodical inspection of all parts of houses, especially of basements, whether by private or official agency, was urged as a most necessary expedient for general adoption. There should

be no 'waste' in a well-managed kitchen; nothing should leave the house except to add to the too scanty dietary of the deserving poor. Cabbage stalks and potato-parings should be burnt. Another unsuspected source of infection was the laundry, especially in the houses of very poor people, to whom servants sometimes sent their clothes to be washed. It was not uncommon to find a fever-patient in a room in which parcels of 'clean' linen were being made up for the butler, cook, or housemaid at a neighbouring mansion, into which by these means the germs of the fever-poison might be introduced. It was urged that all these matters should be more directly under official inspection and control, and that there should be an enforced inspection of all dwelling-houses by sanitary officers.

Special Reports.

THE HYGIENE OF DRESS.

DRESS, as distinguished from mere fashionable attire, has a direct bearing upon health. It has primarily two functions—to clothe and to adorn; but use and beauty, in this as in other cases, so far from requiring any sacrifice for combination, are found each in the highest degree where both are most fully obtained—the fittest or most comfortable dress being that which is most graceful or becoming. Fitness is the primary demand, and the dress which appears to be uncomfortable is absolutely untasteful.

In the æsthetic point of view, dress is always to be considered as secondary to the person. This is a fundamental axiom in the art of costume; but it is often lost sight of, and dress is made obtrusive at the expense of the individuality of the wearer. A man's vest or neck-tie must not seem too important a part of him; and a woman should not be wholly lost in her flounces. A sarcastic critic has said: 'If you are not better and more beautiful than your clothes, you are, indeed, a man or a woman of straw.' It is far from being always true of the human animal that 'fine feathers make fine birds.'

The hygienic relation of dress is not less clearly defined. It has been said that a man's dress is, or, rather, should be, a portable house over him. He should be able to move in it freely. It should keep him warm in cold weather, and not be oppressive in hot weather, though it should protect him from the consequences of draughts, which 'inflict plagues,' the plagues of catarrhs and their numerous followers, or of rheumatism, that implacable tormentor. Such must be taken to be the leading principle of dress in the hygienic point of view, whatever may be its destination, for the peer or the peasant, because its essential object must be the same in both cases.

Our forefathers were wiser in this respect than we are. Their method is worth considering, and cannot fail to be interesting.

On consulting the history of our country, we find that our ancestors were not so subject to consumption and to complaints arising from debility as we are and have been for many generations; and the cause is usually referred to improper exposure, catching cold, etc.

Now our ancestors may be said to have lived almost in the open air. For we find, on examining old mansions as well as inferior houses, that the apertures of the chimneys were very large, and the windows and doors badly fitted, so that when a fire was kindled, the change of air in the apartment must have been very rapid, owing to the influx of fresh air from without in consequence of the burning fire within. In effect, a thermometer placed in such a room, so that the direct rays of the fire might not fall upon the instrument, would stand but a few degrees higher than in the open air—owing to the easy communication between the air of the apartment and the external air.

In such a state of things in our apartments at the present day, we should literally 'perish with cold.' But our ancestors accommodated themselves to the low temperature most effectually, whilst it secured to them that prime requisite, fresh air, which is the all-important condition of healthy, robust, and comfortable existence. They contrived to keep themselves warm by adopting a more judicious method of resisting cold and damp, namely, the use of appropriate clothing.

The general use of homespun woollens, the wadded stuffs for petticoats, and worsted stuffs or brocaded silk gowns, used by the women of other times, formed a much more secure protection from moisture in the air, and resisted the cold infinitely better than the thin unsubstantial drapery of our modern ladies. The men, too, as appears by examining old family pictures, wore their clothes much more full, and of a thicker texture than the scanty coats of half-milled superfine cloths or flimsy 'shoddy,' now so generally worn; and the costume of our judges and chief magistrates—the fashion of which has, perhaps, not altered for centuries—seems well calculated for preserving warmth as well as impressing the idea of dignity. The thick woollen dresses of the monks of old were admirably contrived for keeping their bodies at a due temperature; no part but the face being exposed to the external air, at late vespers or early matins, in passing through the cold cloisters and vaulted aisles of monastic edifices. In all this we find fitness and consistency; and these are the points to which we propose to direct attention in discussing the hygiene of dress in all its bearings. Not only are the public at large deeply interested in this subject, but it also appeals to all the caterers of dress—from top to toe, from head to foot—calling upon them to put forth all the resources of their art to combine the useful with the elegant, the happy marriage of Hygiene with Æsthetics. The discussion cannot fail to stimulate their ingenuity to efforts directed to secure this most desirable combination; and a consideration of the hygienic principles that should regulate the texture of fabrics will tend to develop the resources of the manufac-

turers at large in supplying a better-informed public, solicitous for their health, in the selection of the materials for clothing.

Finally, we propose to describe every novelty in dress—for both sexes—presenting the requirements of hygienic fitness; and shall not fail to make such suggestions as may seem calculated to constitute an improvement.

METROPOLITAN PUMPS.

III.

IN continuing our investigation into the condition of the pumps and wells of London we have visited the neighbourhood of Bloomsbury, and have first to report on a pump in Queen's Square, the water from which has given

Grains per Gallon		Parts per Million	
Solids	Chlorine	Free Ammonia	Albuminoid Ammonia
113·	10·	3·00	0·20

and accordingly is sewage and not drinking water.

This pump is freely open to the public, which no doubt avails itself of it.

In Bloomsbury Square itself there was formerly a pump but it has disappeared.

In Red Lion Square (near Bloomsbury) there is a pump which has been locked up for the last seven years; but the keeper of the pump gives water from it when asked, and we now publish an analysis of the water yielded by this pump on October 30, 1875.

Grains per Gallons		Parts per Million	
Solids	Chlorine	Free Ammonia	Albuminoid Ammonia
Not taken.	10·2	9·50	0·16

This water, is, likewise, sewage.

We next visited an open pump at the corner of Queen's Head Court, Gray's Inn Road, and obtained water yielding—

Grains per Gallon			Parts per Million	
Hardness	Solids	Chlorine	Free Ammonia	Albuminoid Ammonia
30 degs.	53·	4·1	0·01	0·10

This water is, therefore, tolerably good.

The basin of the fountain in Trafalgar Square gave

Grains per Gallon		Parts per Million	
Solids	Chlorine	Free Ammonia	Albuminoid Ammonia
50·	9·9	0·03	0·37

which is very bad.

The pump at the New Inn, St. Clement Danes, gave

Grains per Gallon		Parts per Million	
Solids	Chlorine	Free Ammonia	Albuminoid Ammonia
Not taken.	5·	0·84	0·14

which is bad.

Medical Officers' Reports.

THE SANITARY CONDITION OF OXFORDSHIRE.

DR. GILBERT W. CHILD has lately published his 'second report on the sanitary condition of Oxfordshire.' This report deserves very careful consideration, for, owing to the thorough independence of its author, matters are not minced, neither is there the slightest attempt to compliment or whitewash any of the several sanitary authorities over whose combined districts Dr. Child exercises supervision.

It is a hard report to review, for it is practically a review almost of itself, since Dr. Child is at once political and sanitary.

However, to plunge *in medias res*; 'sanitary statistics, as we are at present able to obtain them, are utterly useless for every scientific purpose, and, indeed, not only useless, but mischievous and misleading.'

'Statistical evidence,' adds Dr. Child, 'is of value so far as it shows certain constant relations subsisting between the different facts or classes of facts which form the data on which it is founded; but in the case of sanitary statistics these data are, for the most past, not facts at all, and bear no determinable relation to each other whatsoever.' Such being the doctor's opinion we can hardly wonder at the following painful sentence. 'A task scarcely less wearisome and useless than that of compiling these statistics is that of pointing out the many obvious facts which go to prove their fallacious character.

It appears to be impossible really to draw, using ordinary registrars' returns, any reliable line between zymotic and other forms of diseases, for 'it is the merest chance in the world whether a death is entered, *e.g.* as measles or pneumonia, whooping-cough or bronchitis, diphtheria, croup or laryngitis,' and with great reason Dr. Child points out the folly of the present arrangement by which all 'diarrhœa' is classed under the zymotic division. 'Some' certificates 'are purely absurd, and others are ingeniously contrived to convey no information, and some convey wrong information.' Unfortunately a True Bill must be brought in on this charge of carelessness, ignorance or fraud, but we do not see how it can be met unless by legislative enactment, ordering registrars not to receive certificates unless given in accordance with definite scientific instructions. If practitioners would only give themselves the trouble to follow the directions at present issued, much of the ground for complaints similar to Dr. Child's would be cut away; but the necessity for such carefulness being entirely voluntary, a slip-shod way of writing causes of death has grown upon us. Instead of writing an obscure case down as an obscure one, a cause, often no cause, but a mere symptom, is jumped at, and so all scientific value and result is at once lost.

Then again Dr. Child righteously complains of 'entirely unaccounted-for' deaths, and after admitting that for distinctly mechanical health work the registrars' returns and the cases of pauper sickness sent by the clerks to the unions are of essential use, Dr. Child instances another great blot or defect in our sanitary system in the lack of

legal obligation to give early, or any, notices of cases of infectious disease. The medical men practising in one of Dr. Child's unions were requested to give information to the medical officer of health of all cases of infectious diseases coming under their care, but they rightly declined to do so, on the ground that, since there was no legal obligation in the case it was not possible to bind everyone down to give the required notice, and the only result would be to throw all the practice—of a certain class at any rate —into the hands of those practitioners who declined to give it.

Going on now to practical work, Dr. Child boldly states that in his opinion 'what is called "a system of sewerage" ' is not to be generally recommended for villages and small towns. 'It does not seem,' says Dr. Child, 'to have occurred to many persons that what we really revolted against was not open gullies, but rather badly constructed open gullies, and that what we are coming back to is, in principle, little or nothing else than well-constructed open gullies.'

As to water-supply, Dr. Child is gradually inclining more and more to the opinion that the construction of proper reservoirs for rainfall is, on the whole, the most promising means.

After stigmatising 'overcrowding,' morally as well as physically the worst of many evils, and pointing out that shutting up, however bad houses may be, only increases the evil, Dr. Child would have sanitary authorities endowed with cottage-building powers, and not only this but also authority to prevent the erection of ill-designed cottages, or on unhealthy or improper sites. Dr. Bond, of Gloucester, has long advocated a similar scheme, but we venture to think that a national building act would sooner check the evil, especially were sanitary authorities who neglected to take action against such 'premises' within their jurisdiction as were reported to them to be 'a nuisance or injurious to health' to be treated as defaulting authorities.

Finally, Dr. Child appeals for legislative assistance in grappling with his grim giant 'on the ground of the dangers, social and political, no less than moral and physical,' which the state of things described involves. 'Many'—of our labourers—'are so crushed by poverty and debt, that it is quite impossible that they should ever get out of the hands of the small tradesmen, or still smaller attorneys, who constitute the chief owners of the petty cottages, without some help from the legislature in the first instance.' 'However slow the English labourers may be to rise, there may yet be a term to their endurance; and should that term ever be reached there is not in England the security for (of) a large class of poor conservatives which we have recently seen to exist in France. The English labourer, unlike the French peasant, has literally nothing to lose, and if once aroused, is likely to prove more like the Frenchman of 1789 than of 1871.'

Admitting that the personal actions of the inspectors of nuisances have been effectual in causing a general degree of increased cleanliness, and complaining that, of the permanent improvements attempted the majority are 'slight, partial, and unsatisfactory,' Dr. Child truly but mercilessly criticises 'sanitary authorities.' Our space will not permit us to follow Dr. Child through his onslaught on a *quasi* defence of these bodies. 'All the most powerful motives upon which men act concur . . . . to induce sanitary authorities *not* to act.' 'The law under which they act is complicated and difficult in the extreme. They have, first of all, to take their own clerk's explanation of it, and then, in cases which involve application to a bench of magistrates, this has to be reviewed in turn by theirs, and generally both these functionaries are strongly predisposed to inaction.' The sanitary authority might be a sufficient administrative body, if only it had any adequate motive to set it going at first, and a few less checks to hamper it when in action. 'There is no sort of proportion between the expense and complication of the machinery which has been created by the sanitary law, and the amount of the work produced.'

Dr. Child ought to be a strong advocate for the universal appointment of stipendiary magistrates, considering the peculiar treatment sanitary cases meet with at the hands of 'The Great Unpaid' in Oxfordshire. However, we are at one with the magistrates in declining to accept any evidence of injury to health except that of the medical officers of health. Dr. Child objects to this principle, because an officer of health may have to make 'two journeys of from twenty to thirty miles, first for the purpose of seeing it (*i.e.*, the case), and secondly, of giving evidence.' We are of opinion that one of the very *raisons d'être* of combined districts is the combining to pay a medical officer of health sufficiently well to enable him to be at the (reasonable) beck and call of each district when required, and also that it should be the rule and not the exception for the medical officer of health to attend, at least once a month, the meetings of the sanitary authority.

Save on this point we cordially endorse in their broad import the whole of Dr. Child's comments and strictures on the now slightly amended sanitary muddle, but think that, after all, the improvements referred to by Dr. Child himself are in themselves no small proof of his and his inspectors' diligence and success.

The various details relating to the districts combined together and served by Dr. Child are frequently of great interest; but in reviewing the report of a representative medical officer of health, naturally the broad lines of policy advocated or taken possess more interest for our readers at large than whether the sanitary authority of Dash-cum-dash have removed an obnoxious pig-sty or caused sufficient accommodation to be provided to a row of houses. That the greater comprises the lesser a reviewer must always keep in mind.

HACKNEY DISTRICT FOR 1874.

THE lengthened experience of Dr. Tripe, medical officer of health for the Hackney district, in a suburban district with a steadily growing population, confers especial interest upon his annual report. It is very desirable to know in what degree increasing density of population augments sickness and mortality, separating and distinguishing, as well as can be done, the various conditions accompanying density, which appear to have a material influence over the death-rate. This problem can be solved more easily in a new neighbourhood than in an old one, because in the former these injurious influences can be traced as they arise, and their value estimated. A largely increased population of wealthy people in a given area might not add to the mortality, whilst a similar increase of poor people of uncivilised habits would be sure to do so. Then too the site and construction of the houses, the ventilation and drainage, and the various occupations of the inhabitants, might be identified, after careful observation, with the causation of the forms of disease which were most common in particular localities.

Dr. Tripe informs us in his first table, that in the last ten years the population of Hackney has increased from 98,938 to 137,571 and the density per acre from 25·2 to 34·9, which is not yet equal to the average density of the metropolis. The births have increased from 3,356 to 4,755 and the deaths from 2,063 to 2,799.

It is observable that the marriage-rate does not increase so rapidly as the birth-rate—for instance, in 1865 the marriages were 1,183, and in 1874 1,271; in point of fact, in every year up to 1872—a series of six years—there were fewer marriages than in 1865, yet the births went on increasing.

This disaccordance between the marriage-rate and the birth-rate might be, in a considerable degree, caused by the migration into the district of a large proportion of married couples, who continued to add to the population. On the other hand, there is a reasonable ground for suspicion that certain classes in Hackney are not so scrupulously virtuous as in times past; and local economists might be able to tell us whether the reduction of marriages

was due to any lack of prosperity, in those years, among the working classes.

Dr. Tripe's second and third tables give the proportion of births and deaths in the five sub-districts to the whole number of births and deaths; but as we do not perceive that the population of the sub-districts is also given we are unable to fix a rate to population, or to come to any conclusion as to the influence of population on the marriage-rate—a matter of much interest. For example, it would be desirable to know whether in particular parts the working population is packing too close, and thus creating conditions unfavourable to morals as well as to health.

The evidence Dr. Tripe gives of the infant mortality of the district is very favourable to it. He shows that the highest rate per cent. to the total births—that for South Hackney, 14·6—is less than the mean rate for London, 15·5; whilst the mean rate for the whole district was only 13·8. We find also, from another table, that the mortality from zymotic diseases was 16·4 of the whole number of deaths, and 3·3 per 1,000 of the population. This also is a favourable testimony to the health of the district. We are informed, in fact, that last year the deaths from zymotic diseases were unusually few in spite of the epidemic from scarlet fever, and that in that year the smallest percentage was registered since the passing of the Metropolis Local Management Act. Whilst, however, there was a decrease of mortality from zymotic diseases, there was a marked increase from pulmonary affections—a significant fact in many aspects.

Perhaps the most important tables in Dr. Tripe's report relate to the comparative mortality at different ages and from different diseases, in seven warm and cold weeks. The general truths affirmed are the same as those already well established; the details are, nevertheless, very interesting.

The remainder of Dr. Tripe's report relates to the sanitary work of the year. Dr. Tripe enforces the necessity of regular inspection of all the small houses, to abate nuisances. He shows that only 466 nuisances were abated on complaint sent to the office or otherwise made to the inspector, out of a total of 6,110. This duty of regular inspection cannot be too strongly enforced; it is the mainspring of all sanitary work, and the only source of practical efficiency. We observe that 3,712 preliminary, 1,662 peremptory, and 873 statutory notices were served during the year. We presume that the preliminary and peremptory notices are extra-legal courtesies, invented by the board to assuage the operation of the law upon the oversensitive epidermis of their constituency. Such complicated processes must go far to neutralise the advantage of the regular inspection which Dr. Tripe so creditably maintains.

Law Reports.

TWO milkmen, Oliver Culles and George Daw, were respectively fined 10*s.* and 20*s.* and costs, at the Wandsworth Police Court, for selling milk adulterated with 20 and 12 per cent. of water.

MR. W. A. RYDER, of Bicester, was, at the Bicester Sessions, sentenced to seven days' imprisonment for refusing to have his child vaccinated, and declining to pay a fine of 20*s.* therefor, and 10*s.* costs. The defendant is known as a public lecturer against vaccination.

CHARLES FISHER, of No. 2, South Brent, Highbridge, has been convicted at the Guildhall Police Court, of having sent to the London market four quarters of beef which were unfit for human food. Having previously been found guilty of a similar offence he was sentenced to three months' imprisonment.

BREACH OF THE FACTORY ACT.

AT the Ipswich police-court, F. Corder, linen draper, has appeared in answer to eighteen informations, charging him with breaches of the Workshops Act, 1867, on July 31. Mr. J. B. Lakeman, sub-inspector of factories, who appeared for the prosecution, stated that the information on which the prosecution was founded was supplied by the defendant himself in the notice which he was compelled by law to send of his intention to work overtime. He was the occupier of a shop where dressmaking and millinery were carried on, and during the months of June, July, and August had availed himself of the permanent modifications of the Act of 1867, and had substituted Thursday for Saturday on which to give the compulsory half holiday, in order that, Thursday being a general early-closing day during those three months, all the young people in the town might be out together. Corder sent notice that he would work overtime till twelve o'clock on Saturday, July 31, but his workmen were not actually employed beyond eleven o'clock. Mr. Lakeman contended that though in the matter of the half-holiday Thursday might be substituted for Saturday, yet, for the purpose of working overtime, Saturday could not be substituted for Thursday, the statute providing that where the half-holiday was given on any other day but Saturday, on the latter day the shops must never remain open beyond eight o'clock.—Julia Fisher, the principal in Corder's workshop, was the only witness. She stated that having a large mourning order to finish she put it to the girls under her, without the knowledge of Corder, whether, as the following Monday was Bank Holiday, they would work overtime on the Saturday, or come on the Monday, and the latter was unanimously negatived. She was not aware that she was infringing the Act.—The magistrates decided to convict, and Corder was fined 2*l.* 5*s.* in all, and costs in each case.

VACCINATION PROSECUTIONS.—IMPORTANT MEDICAL TESTIMONY.

AT the Skipton petty sessions several vaccination defaulters were summoned at the instance of the vaccinating officer to the Skipton guardians.

The following letter from Dr. Rix, medical officer of the Bradford Fever Hospital, was then read by the chairman, who said the writer was a man of very considerable experience, and he, therefore, wished to read it for the sake of the public.

'I think I can say nothing more convincingly in support of the efficacy of vaccination, in reducing the severity of small-pox, than is contained in the last annual report of this hospital (which I forward to you). There it will be seen that the proportion of deaths in the vaccinated is 7·54 per cent., as against 45·45, or nearly 50 per cent. in the un-vaccinated. I am of opinion that were vaccination universally and thoroughly performed, small-pox would cease to exist, and death, at all events, would be unknown from this disease. What seems to be ignored by some portion of the public is the fact that, although many unvaccinated cases recover, they are subject to a long and dangerous illness from a loathsome disease, often leaving them permanently disfigured, whilst the vaccinated suffer little or nothing, are rarely in danger, and afterwards show no traces of the disease. A movement in favour of more thorough vaccination would be one in the right direction.'

'October 8, 1875.' 'W. K. RIX.'

That, observed the chairman, is written by a man of large experience, who can have no prejudice in the matter; and his opinion, I should think, to 99,000 out of every 100,000 people would go much further than that of you three individuals who are going to be fined to-day. The chairman, after conferring with the other members of the bench, said: You, Jonathan Mason, you, Henry Barron, and you, William Crossley, are fined 20*s.* and costs.—Crossley to the bench: What in default?—The chairman: A distress warrant, which will cost you a great deal more. The defendants then stood down.

ADULTERATION OF BREAD.

(*The Moon Case.*)

AT the Middlesex Sessions, October 23, the appeal in the case of the *Queen* versus *John Robert Moon* was heard. It was an appeal against a conviction, dated July 3, 1875, by F. H. W. Glossop and J. R. Hogarth, Esqs., two of the justices of the Brentford division, for selling adulterated bread. Mr. Moon is a baker and confectioner, carrying on his business at Oxford House, Ealing, where he has resided for the last twenty-five years. On May 26 last Mr. Gregg, inspector of weights and measures for the district, caused a loaf to be purchased at Mr. Moon's shop, and on the following day took it to Dr. Redwood, at the Pharmaceutical Institute, Bloomsbury Square, the public analyst for the district. At the time the loaf was purchased Mr. Moon took another loaf from the same batch, and requested Mr. Gregg to seal it up or mark it for identification, so that it might also be analysed on his behalf. Mr. Gregg declined to do this, and Mr. Moon subsequently applied to Dr. Redwood for leave to be present at the analysis. This request could not be complied with, the regulations requiring that the public analysts should be kept in ignorance of the ownership of the articles sent to them for analysis. The loaf which Mr. Gregg had refused to mark was kept by Mr. Moon in case any proceedings should be taken. Having completed his analysis, Dr. Redwood gave a certificate that the loaf was adulterated with alum, but not to an extent injurious to the health of the consumers, the proportion of alum being twenty grains to the 4lb. loaf. This worked out arithmetically would be in the proportion of one to 1,400. On this certificate Mr. Moon was summoned before the Brentford bench of magistrates. The evidence for the prosecution was that of Mr. Gregg, the person who bought the loaf, and Dr. Redwood's certificate. Mr. Moon called all the persons in his employ to prove that no alum was ever used in his establishment, the firm of millers with whom he dealt to prove the genuineness and purity of the flour supplied to him, and Dr. Wanklyn, the public analyst for Berkshire, and Mr. Nesbitt, his assistant, who had analysed the loaf from the same batch as that given by Mr. Gregg to Dr. Redwood and which Mr. Gregg had refused to mark, and who said that the loaf was unadulterated. Mr. Moon also applied that the remaining portion of the loaf analysed by Dr. Redwood might be analysed by some independent scientific gentleman, to be named by the bench. The magistrates did not, however, think fit to accede to this application, but convicted Mr. Moon, and fined him 40*s.* and two guineas costs. From this conviction Mr. Moon appealed, and the case was heard at the last appeal day, the same evidence being given on both sides as before the magistrates at Brentford. After the evidence of Professor Wanklyn and his assistant, Mr. Nesbitt, the Court resolved that there should be a further analysis, and adjourned the decision of the case till to-day for this analysis to be made. Dr. Stevenson, Lecturer on Chemistry at Guy's Hospital, was the gentleman selected by the Bench to conduct this analysis, and Professor Wanklyn and Dr. Redwood had permission to attend at the analysis. To-day, Professor Stevenson's certificate was read by Mr. Beal, the deputy-clerk of the peace. It was to the effect that the bread was not adulterated and that it contained no greater trace of alumina or mineral matter than is always and necessarily present in genuine wheaten flour. On this certificate being read, Mr. Besley, for the respondent justices, at once admitted that it was impossible any longer to uphold the conviction, and that it must be quashed, and addressed the Court on the subject of costs. Mr. Edlin, the assistant-judge, said that Mr. Moon had completely vindicated his character as a baker of pure, unadulterated bread. The conviction must be quashed, and the appellant must have his costs of the appeal, and no order would be made as to the costs of the proceedings below.

Correspondence.

NEW BUILDINGS.

(*To the Editor of the* SANITARY RECORD.)

SIR,—In your paper of last week, on the Public Health Act, 1875, you state that where now only the front of a house is taken down the local authority may compel the putting back of the house to a prescribed line. May I ask the favour of your opinion whether you consider this may not be evaded by parties simply pulling down to within a stone or two of ground floor, and rebuilding on an old foundation? Section 148 seems to give local authorities sufficient power to treat all re-erections as new buildings; whilst sec. 152 throws a great doubt as to what is to be considered as a new building.

A MEMBER OF A LOCAL BOARD.

[The question of our correspondent is hardly a fair one, as he can hardly expect us to point out means for 'evading' statutes passed for the protection of the public health. But the words of the statute are 'When any house or building, situate in any street in an urban district, *or the front thereof*, has been taken down in order to be rebuilt or altered, . . . the authority may prescribe the line, etc.' The suggestion in our correspondent's letter would, therefore, if carried out, be insufficient to take the case out of the operation of sec. 155 of the Public Health Act, 1875. Our correspondent has, in some way, misquoted the Act, as sec. 148 relates to turnpike roads, and sec. 152 to private streets, etc.]

THE FACING OF TEA.

(*To the Editor of the* SANITARY RECORD.)

SIR,—In reply to Dr. de Chaumont, I have to point out that the usual facing of tea is perfectly innocuous, as will be readily understood when it is mentioned that the amount of China clay or of plaster of Paris necessary for facing tea does not exceed 1 per cent. of the weight of the tea, and that the amount of Prussian blue requisite to blue the China clay or plaster of Paris amounts to a very small per centage on the clay or plaster of Paris.

As to the objection that the facing of tea involves the handling of it in a disgusting manner, it may be remarked that a precisely similar objection might be taken to the entire operation of preparing the leaves for the market.

I observe that, whilst Dr. de Chaumont does not deny the parallel between the colouring of tea and the colouring of butter (which apparently he thinks ought to be made penal) he does deny the parallel between the colouring of tea and the colouring of textile fabrics. He will, however, find a difficulty in specifying any essential particular in which the parallel fails. His assertion that the dyeing of textile fabrics is a process of recognised utility, prompts the question—What utility? Undyed cottons and woollens would protect our bodies from change of temperature quite as well, and indeed a trifle better than the dyed articles. Dyeing does not strengthen a fabric and make it last the longer; on the contrary, it sometimes weakens it and destroys it. Dyeing conceals dirt, and sometimes makes an inferior fabric seem a superior one. Cases are recorded of damage being inflicted on the human skin—nay, of actual poisoning—through the wearing of clothing dyed with certain dyes. And whilst a society for the abolition of the use of dyes would have almost as much to say as societies for prohibiting the use of intoxicating liquors, all that can be replied in favour of dyes is that they are pleasing to the sight, and occasionally capable of employment as marks of easy distinction. But this applies to tea; evidently it is pleasing to many people to see it green, and just as a red coat may be useful as a mark for distinguishing a soldier, so the fine green on one side of the tea-caddy, enables my lady to distinguish between the two varieties of tea, which otherwise would resemble one another in external appearance.

J. ALFRED WANKLYN.

Review.

The Public Health Act, 1875, 38 & 39 Vict., cap. 55, with short explanatory notes. By J. V. VESEY FITZGERALD, Esq., B.A., Barrister-at-Law, Inner Temple, etc. London: Longman, Green, and Co., 1875.

IT is a most difficult thing to understand many of the points referred to in the Public Health Acts, now that these have been consolidated into one Act; indeed, without the aid of such a work as the one before us, few but specially trained students could ever hunt them up, to say nothing of comprehending them. It is a work prepared especially for the use of those who have to deal with the Act from a sanitary point of view, and who, at the same time, find it necessary to be right from a legal point as well. With this intention, the bulky provisions of the Land Clauses Acts are wisely left out, and their place filled by notes where, in the opinion and experience of the author, such explanations were needed. Where the same points have been several times decided, Mr. Fitzgerald quotes some of the more recent cases. And we may here mention that so thoroughly is this last desideratum carried out that nearly five hundred cases have been so cited to lighten the burden of the student. This is a work, therefore, which deserves especial encouragement at the hands of those who wish for a compact synopsis of our sanitary law.

The arrangement of the clauses is made in the following manner: first, the title and definitions—and then the constitution of districts and authorities. Those who are troubled to find out the exact difference between urban and rural sanitary districts and authorities, or wish to study the incorporation of local boards and improvement commissioners, can do so here to their hearts' content. The sanitary provisions relative to sewerage and drainage then follow: afterwards the disposal of sewage, construction of water-closets, earth-closets and privies, and their bearings upon the clauses of the various Acts, scavenging and cleansing streets and houses, the offence of unclean ditches, and the powers of local authority in relation to the supply of water, bringing up the rear of that section. The Waterwork Clauses Act is then fully gone into, the protection of water against fouling being especially useful. Next we find the regulations of cellar dwellings and lodging-houses, the definition of the word 'nuisances,' and offensive trades. The question of infection is also completely dealt with. Of course a great portion of the work is taken up with the powers of different bodies for rating and borrowing, and the laws as to prosecution of offences and recovery of penalties; but whilst that is essentially useful, it will not likely interest all of our readers. The book concludes with the saving clauses and repeals of Acts and the necessary schedules, whilst a very complete index acts like the concluding Alexandrine to this unpoetic subject.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

BELL, Mr. Barron, the Surveyor, has been appointed Inspector of Nuisances for the Hallwell Urban Sanitary District: 80*l.* per annum for two years.

BLYTHMAN, Clement Samuel, M.B., C.M. University Edinburgh, M.R.C.S. England, has been appointed Medical Officer of Health for the Swinton Urban Sanitary District.

BOWSER, Richard, Esq., has been appointed Chairman of the Bishop Auckland Urban Sanitary Authority, vice Trotter, deceased.

BROADBENT, James, Esq. has been appointed Treasurer to the Penkridge Rural Sanitary Authority, vice Dickenson, deceased.

CARRICK, William, Esq., has been appointed Treasurer to the Stafford Rural Sanitary Authority, vice Dickenson, deceased.

COLLINS, Mr. John, has been re-appointed Inspector of Nuisances for the Bedwellty Rural Sanitary District: 80*l.* for one year.

LOVETT, Samuel Robert, L.R.C.P. Edinburgh, and L.M., L.S.A. London, has been appointed Medical Officer of Health for the St. Giles and St. George District, vice Ross, deceased: 150*l.* per annum.

MARKS, Mr. William Lloyd, has been re-appointed Inspector of Nuisances for the Rhymney Urban Sanitary District for five years.

MONCKTON, E. P., Esq., has been appointed Chairman of the East Molesey Urban Sanitary Authority.

SHARP, William, Esq., has been appointed Treasurer to the Stafford Rural Sanitary Authority, vice Dickenson, deceased.

TOPPING, Mr. John, has been appointed Surveyor to the Fleetwood Urban Sanitary Authority, vice Willacy, resigned.

WILLIAMS, William Edwin, M.R.C.S. England, L.S.A. London, has been re-appointed Medical Officer of Health for the Bedwellty Rural Sanitary District: 40*l.* for one year.

WILLIAMS, Mr. Hugh, has been appointed Surveyor to the Garston Urban Sanitary Authority, vice Standing, deceased: 200*l.* per annum.

VACANCIES.

BETHNAL GREEN PARISH. Medical Officer of Health: 150*l.* per annum.

BRAMPTON AND WALTON URBAN SANITARY DISTRICT. Collector: 35*l.* per annum. Application, 16th instant, to George Margereson, Clerk to the Authority, Brampton, Cumberland.

DORCHESTER. Surveyor and Inspector of Nuisances to the Corporation and Urban Sanitary Authority. Application, 19th instant, to G. Symonds, Town Clerk.

HUDDERSFIELD. Inspector of Nuisances for the Borough and Urban Sanitary District: 140*l.* per annum. Application, 16th instant, to Joseph Batley, Town Clerk.

ILKESTON URBAN SANITARY DISTRICT. Surveyor, Collector, and Inspector of Nuisances: 120*l.* per annum. Application, 16th instant, to Wright Lissett, Clerk to the Authority.

PLYMPTON ST. MARY RURAL SANITARY DISTRICT. Medical Officer of Health for No. 5 Sub-district. Application, 18th instant, to F. W. P. Cleverton, Clerk to the Authority.

STOCKPORT. Surveyor to the Corporation and Urban Sanitary Authority. Application, 15th inst., to Walter Hyde, Town Clerk.

ST. LUKE, MIDDLESEX, PARISH OF. Surveyor: 250*l.* per annum. Application, 23rd instant, to W. W. Hayne, Vestry Clerk, Vestry Hall, City Road.

SANITARY PATENTS.

2401. House traps. Edward Gregson Banner, Billiter Square London.

3263. Improvements in fire-escapes applicable for other purposes. Louis Fremion and Alfred Lazon, Beauharnais, Paris.

3436. Improvements in utilising waste heat. John Stirling and Thomas Peacock, Coatbridge, Lanarkshire, N.B.

3440. Improvements in argand gas-burners. Henry Jewitt, Kentish Town, London.—A communication from William Rose, New York, U.S.

3443. Improvements in apparatus for drying fruit, vegetables, and other matters for the better preservation thereof. Benjamin Alfred Oakes, Rectory Road, Hornsey, Middlesex.—A communication from Andrew Jackson Reynolds, Chicago, Illinois, U.S.

3446. Improvements in combined engines and pumps. Frederick William Crohn, Hammer's Terrace, Greenwich, Kent, and John Charles Raymond Okes, Maida Vale, London.

3511. Improvements in boilers for heating water for warming buildings. John Hartley and Zaccheus Sugden, Atlas and Premier Works, Halifax, Yorkshire.

ABSTRACTS OF SPECIFICATIONS.

859. Stoves. H. Crichley, Birmingham.

According to this invention the stove or fireplace consists of two concentric chambers, the inner chamber having a grate near its bottom, and being wholly closed except at the front of the fire-grate. The inner or combustion chamber communicates with the outer chamber by slots or openings in its side and below the grate. Air for combustion enters the stove through the front bars of the grate, and the heated air and products of combustion descend through the incandescent fuel in the grate and enter the outer chamber by the exit slots described, which chamber is heated by the circulation of the hot air therein, as well as by the heat radiated from the combustion chamber. The heated air escapes from the outer chamber by a pipe or flue, or may be utilised for any required heating purposes.

808. Stoves. R. George, Kentish Town.

This invention relates to improvements in the arrangement and construction of stoves whereby the quantity and combustion of the fuel employed can be regulated so as to determine approximately the length of time required for its consumption, and also the temperature of the room or chamber in which it is placed. For this purpose a metallic chamber of cylindrical or other suitable form is constructed, placed upon legs or other supports, the upper end of which is closed by means of a cover, and a sand, water, or other suitable joint. At the lower part of the chamber a door is placed, in communication with the ash-pit or chamber below the fire grate. The aperture to supply air for combustion may either be formed through the door or otherwise into the ash-pit. The metal chamber is lined with fire-clay or other refractory material, the interior of which is of taper or conical form; and in order to increase or diminish the capacity of the combustion chamber, the fire-clay lining is made in rings, tubes, or sections. A pipe or passage is formed at a suitable height through the side of the stove for the outlet of the products of combustion, and so as to divide the inner chamber into a lower combustion chamber and the upper reserve chamber for the fuel.

OPEN CONTRACTS FOR SANITARY WORK.

Board of Works, St. Saviour's District, November 17.—For the performance of sewer and drainage work. Mr. H. Simpson, Board Room, Emerson Street, Bankside, S.E.

Hamilton, November 15.—For the construction of two reservoir embankments, etc. Mr. W. R. Copland, 83, West Regent Street, Glasgow.

Richmond (Surrey), Water Supply, November 15.—For the construction of a reservoir and other works. Messrs. Russ and Minns, 9, Victoria Chambers, Westminster, S.W.

Worthing Local Board of Health, December 4.—For supplying a 90 horse-power steam-engine, with two boilers, pumps, etc. Mr. Lund, Surveyor to the Board, Town Hall, Worthing.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer—not necessarily for publication.

THE only address of Mr. Banner, inventor of sanitary appliances, is 11 Billiter Square, E.C.

DRESSES FOR NURSES.

(*To the Editor of the* SANITARY RECORD.)

SIR,—It is no doubt very convenient for nurses to wear a distinctive dress, but why need it be so hideously ugly as that often worn is? If one as comfortable and convenient as can be arranged were chosen, such would be in such marked contrast to any fashion I have seen as to be very distinctive. I wish Mrs. B. Adams (p. 368) would persuade nurses to act upon Miss Nightingale's wise suggestions as to their dress.

P. W. HOLLAND.

MORTALITY FROM SCARLET FEVER.

DR. BARCLAY, the medical officer of Chelsea vestry, in a report lately presented to that body, remarks, 'From all I can learn I am inclined to believe that scarlet fever is not so prevalent as it was, but is more fatal; and I attribute the higher rate of mortality to its now affecting the poorer classes of society and the advent of the cold weather. Good ventilation is most essential to recovery, and this cannot be found in the crowded dwellings of the poor after the cold weather sets in.'

DROUGHTS AND FLOODS IN EUROPE.

THE Vienna Academy of Sciences, says *La Naturr*, is occupied with a question which concerns all Europe—the decrease of the quantity of water in springs, rivers, and watercourses. A circular, accompanied by a very instructive report, has been addressed to the scientific societies of other countries, inviting them to undertake observations which, in time, may yield useful results. The Academy calls attention to the fact that during a certain number of years there has been observed a diminution in the waters of the Danube and other large rivers, especially since the practice of felling forests has become common. The Austrian Engineers' and Architects' Union are also occupied with this question, and have appointed a Hydrostatic Commission to investigate it.

TOBACCO POISONING.

IN addition to nicotine, hydrogen-sulphide, and cyanogine, which have been long recognised as the common poisons of tobacco smoke, Dr. Krause, of Annaberg, has recently discovered carbonic oxide. The quantity of the oxide and of carbonic acid differs according to the kind of cigar used, the way of filling the pipe, etc. The manner in which the smoke is drawn, whether by strong or weak inhalations, also influences the products by affecting the combustion. From twelve experiments made by Dr. Krause, it appears that the quantity of carbonic oxide varied from 5·2 to 13·8 in 100 of smoke, the average being 9·3. As the consumer of the weed never gives out all the smoke, but takes a portion of it into his lungs, a certain amount of carbonic oxide poisoning is inevitable. 'The more awkward the smoker,' says Dr. Krause, 'the more rapidly will the action of the carbonic oxide make itself felt; hence the evil effects of early studies in smoking, the results of which are commonly ascribed to nicotine alone.'

POISONING BY GOAT'S MILK.

ACCORDING to recent German journals, several cases of poisoning by goat's milk have occurred in Rome. The cases, which all occurred in one locality (Borgo Rione), had the character of cholerine, and some of them that of well marked cholera. In some of the cases, recovery took place in twenty-four hours: but most of the patients were ill four or five days. The severity of the symptoms was in direct relation to the quantity of milk used. On veterinary examination, the goats were found to be in perfectly good condition. In their pasture, however, were found four poisonous plants; viz., *Conium maculatum, Clematis vitalba, Colchicum autumnale*, and *Plumbago Europæa*. On making a chemical examination of the milk and also of the vomited matters, Professor Ratti found in both colchicin, the passage of which into the milk was thus most probably the cause of the poisoning. It is well known that goats can eat with impunity hemlock and tobacco; but that they also eat colchicum, which acts as an intense poison on cows and other animals, was hitherto unknown. It has been suggested with reference to these cases, that *Momordica elaterium* may have played a part in them as well as colchicum; but Professor Ratti has shown that the elaterium is avoided by goats when they meet with it in their pasture.

FIRES CAUSED BY IRON RUST.

A POSSIBLE cause for fires is suggested by Colonel Angus Crell by the following hypothesis: When oxide of iron is placed in contact with timber, excluded from the atmosphere, and aided by a slightly increased temperature, the oxide parts with its oxygen, is converted into very finely-divided particles of metallic iron, having such an affinity for oxygen that, when afterwards exposed to the action of the atmosphere from any cause, oxygen is absorbed so rapidly that these particles become suddenly red-hot, and, if in sufficient quantity, will produce a temperature far beyond the ignitable point of dry timber. Wherever iron pipes are employed for the circulation of any heated medium (whether hot water, hot air, or steam), and wherever these pipes are allowed to become rusty, and are also in close contact with timber, it is only necessary to suppose that under these circumstances the finely-divided particles of metallic iron become exposed to the action of the atmosphere (and this may occur from the mere expansion or contraction of the pipes), in order to account for many of the fires which periodically take place at the commencement of the winter season.

CONSTRUCTION OF CHIMNEYS.

THE new Act for the enforcement of the law of 1840, which prohibits the employment of climbing boys for sweeping chimneys, and which comes into operation on December 1 next, contains several provisions regulating the construction of chimneys and flues. All widths and partitions between any chimney or flue which at any time after the passing of this Act shall be built or rebuilt are to be of brick or stone, and at least equal to half a brick in thickness, and every breastback and width, or partition of any chimney or flue, hereafter of be built or rebuilt, shall be built of sound materials, and the joints to the work well filled with good mortar and cement, and rendered or stuccoed within; and also that every chimney or flue hereafter to be built or rebuilt in any wall, or of greater length than four feet out of the wall, not being a circular chimney, or flue twelve inches in diameter, shall be in every section of the same not less than fourteen inches by nine inches; and no chimney or flue shall be constructed with any angle therein which shall be less obtuse than an angle of 120 degrees, except as in hereafter excepted; and every salient or projecting angle in any chimney or flue shall be rounded off four inches at the least, upon pain of forfeiture, by every master builder or other master workman who shall make or cause to be made such chimney or flue, of any sum not less than 10*l*., nor exceeding 50*l*. Provided, nevertheless, that notwithstanding this Act chimneys or flues may be built at angles with each other of ninety degrees and more, such chimneys or flues having therein proper doors or openings not less than six inches square.

CANTERBURY.

THE extensions to the sewage works at Broadoak which have been carried out at a cost of 1,000*l*., inclusive of the purchase of the land, are now completed. The sewage from the city enters the building, and is received into a pond about two yards square, the wall of which is parallel with the front of the building, and low down beneath the surface there is a pipe, a little less in diameter than the main sewer. Through this pipe the sewage forces its way into a settling pond, where the great mass of the solids is retained. The liquid sewage then flows back out of the first settling pond, and goes out at the side into a shallow channel which leads to the second settling pond. The sewage flows over a rising gradient—intended to lessen the rate at which it travels, in order to give time for further settling—into the second settling pond, out of the further end of which it flows slowly into the third pond, and again out of the opposite end of that into the fourth. Thence the sewage flows onward, passing through a broad channel sixty feet long by ten feet wide, of concrete, into the duplicate system of filter beds, each eighty feet long by six feet wide, of which one is constantly at work while the other is cleansed. At the top of the range of beds is a channel some nine inches deep, from which the water flows gently over in the first filter bed, which is filled to the depth of three feet with coarse and fine flint stones, thence it rises through arches at the bottom, through a similarly filled filter bed, and again falls over in a small cascade into the third bed, rises again through a fourth bed from which it flows into the channel that is to conduct it to the outflow at Fordwich. When a settling tank has to be cleaned out, the flow into it is stopped, and the liquid is drained out of it, until the solids alone remain. These solids, which are of the consistency of very soft mud, are then pumped out, and flow into ponds outside the walls of the sewage house, where the stuff is allowed to lie, until much of the moisture has evaporated or drained away, leaving a tolerably hard residuum. This is carted away by the contractor, who pays the Corporation 50*l*. a year for it, and it finally finds a resting-place upon a farm at Nackington, where it is used with success for manuring the crops.

EARTH TO EARTH.—The superiority of the London Necropolis (Woking Cemetery) has been specially recognised in the *Times*, and other leading journals, and it is admitted that here only can the burial of the dead be properly carried out. The Company is prepared to conduct Funerals without the intervention of the ordinary undertaker at any stage of the proceedings. Prospectus free.—Office, 2 Lancaster Place, Strand, W.C.

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Original Papers.

UNINHABITABLE LONDON.

Castle Alley, Whitechapel.

IN a short series of articles by Mr. Thomas Hughes, Q.C., in the SANITARY RECORD, July 4, 11, 18, 1875, we discussed the subject of the means of improving the uninhabitable residences of the poor in various parts of London, and among them, Castle Alley, Whitechapel. We gave a history of the efforts ineffectually made up to that date towards clearing it away.

Students of the working of recent sanitary legislation will find the proceedings of the Whitechapel District Board of Works, in respect to this same locality now before them, interesting.

This board is elected by the vestries of some half-dozen East London parishes—Whitechapel, Aldgate, Spitalfields, etc., and has always done its work fairly well.

It was the second public body to use Mr. Cross's new Act, in order to pull down a very extensive fever-nest—probably the worst in London.

It has now to settle a small question which has more than once been before it during the last few years. A narrow alley leading out of High Street, Whitechapel, to a new School Board school, built to accommodate 1,272 children, is in a most unhealthy condition.

Dr. Liddle, the medical officer of health to this board, reported, in 1874, of this:—'Castle Alley is a very narrow thoroughfare, which is entered by a covered way, several feet in length, and only three feet in width. Owing to the frequent deposit of filth in this narrow passage, and from its defective ventilation, it is generally in an offensive condition. This alley contains an area, including the space on which the houses stand, of about 1,496 square yards, and has a population of 347, consisting of the very poorest class, each person having an average space of only four square yards. Some of the houses on the east side of the alley are very old, and so badly constructed that, a few years ago, I presented a report to the board, under the Artisans' and Labourers' Dwellings Act, stating that, in my opinion, the said houses were unfit for habitation. On my report being referred to the late Mr. Fricker, the surveyor to the board, some alterations, under his direction, were carried out by the landlord, and my report was necessarily withdrawn. These houses have been still further improved; but, owing to the defective ventilation of this part of Castle Alley, they are far from being in a satisfactory sanitary condition.

'The eight houses on the west side of the court are very old—the walls and flooring of the cellars are wet, and a most unwholesome smell issues through the floors of the lower rooms, which render such rooms unfit for habitation.

'The privy of each house is in the cellar, the nuisance from which (there being no other means of escape) ascends by the staircase, and makes its way into every room of the house. It is almost impossible for the tenants of these houses to keep the, rooms clean, for the houses are three stories high; the privies are in the cellars, which are difficult of access; and the water-supply is in the court. As there are no sinks in the houses, all the dirty water must be either carried down four flights of narrow stairs to the privy, or thrown into the open court.

'In conformity with the twelfth section of the Artisans' and Labourers' Dwellings Act, four householders, living near to this alley, have represented to me in writing, that the said eight houses are in a condition or state dangerous to health, so as to be unfit for human habitation. In compliance with this representation I have specially inspected the said houses, and I confirm the opinion as above expressed, and have reported my opinion thereon to the board.'

This was in June, 1874; the board at once considered what could be done under the Act mentioned, known as 'Torrens' Act' of 1868.

If the board had condemned the property, an appeal could have been made by the landlords to a magistrate.

On more than one occasion, when the board had condemned property of a like character to this, the magistrate had reversed the decision, and the landlords thereon defied the board, and refused to make the smallest improvement.

These decisions of the magistrate may appear unaccountable; but it must be borne in mind, that houses well-built perhaps a century ago, to contain only one family in each, may be as the board surveyor reported of these in June, 1874, *not structurally* unfit for habitation, and this is all the magistrate has to decide—and yet very unfit for a family of its present inhabitants to live in each room. The district board had this fact before them, and also that to carry out Torrens' Act in this case would be simply to confiscate the property; more august bodies than the Whitechapel District Board of Works would probably hesitate at this.

The landlords promised to make some alterations for improved ventilation, and to keep the houses clean, and the board agreed to give a further trial.

The alley is now again condemned by the medical officer, and this time by the surveyor too. The owners are summoned to attend the next meeting of the board, and no doubt will do so attended by their solicitors. Mr. Cross's new Act cannot be applied in this case, because it is passed for the purpose of pulling down and *rebuilding*. This narrow alley could not be rebuilt. The true solution of the problem is probably that suggested by a member of the board, to make the alley into a new street, applying to the School Board and to the Metropolitan Board of Works for part of the cost.

Meanwhile the public may watch the discussion which will take place, recollecting that under Torrens' Act there is no superior power to force the local board to take action.

FOUSEL OIL IN WHISKY.

BY H. C. BARTLETT, PH.D., F.C.S.

IN all spirits distilled from raw grain, or but partially malted or converted starch, amylic alcohol is an invariable accompaniment. Consequently, it has been assumed, with considerable probability, that this secondary product is the result of fermentation during the conversion of the starch into sugar, contemporaneously with the vinous ferment which is transforming the sugar into alcohol and other by-products. The term amylic is derived from amylum (starch), but it is better known as fousel oil or fusil

from φύω (to produce), by reason of the so-called oil being the product of fermentation, and having no prior existence in the substances from which it is evolved during the process. In this respect it is similar to the volatile oil of mustard, which is also the result of fermentation, and in its first effects upon the organs of sensation the parallel still holds good. The strong penetrating odour, sharp burning taste, and its acrid, rubefacient, and vesicant properties are strongly characteristic of both, but here the similarity ends, for fousel oil is a pure hydrocarbon of peculiar composition, while the volatile oil of mustard contains of its essential constitution both nitrogen and sulphur.

Fousel oil has long been familiar to the illicit distillers under the name of potato oil, the distillation of potato mash yielding a very considerable quantity of this objectionable alcohol. All other unconverted grains produce more or less fousel oil, and damaged grain will evolve large proportions of it, notwithstanding every attempt to malt or convert the starch into sugar before mashing.

Spirit containing any sensible quantity of fousel oil can be detected as it flows from the still in a hot state. The irritation of the eyes and nostrils, the resemblance to the smell of an alcoholic solution of cyanogen, and the maddening intoxication produced by the consumption of such spirits, would be sufficient to deter most drinkers of common gin and whisky, if they were to apply their noses to the discharge-pipe of the cooler of a raw-grain whisky still.

For a long time after distillation, raw-grain spirit is absolutely undrinkable unless rectified, this rectification consisting in re-distillation after the first spirit has been digested and agitated with 'grey salts' (caustic potash and lime). Unfortunately, this rectification, although it removes almost all the fousel oil, also destroys every trace of the agreeable and wholesome flavour of malt, which is the chief characteristic of good whisky, and it imparts a nauseous flavour of its own, which is recognised in inferior spirits of wine. This is commonly covered by flavouring compounds, such as cardamoms, coriander seeds, angelica root, almond cake, juniper berries, and sometimes a little turpentine; such flavoured spirit being the gin of commerce.

Dr. Ure declared that after many months the fousel oil contained in raw-grain spirit spontaneously decomposes in the alcohol, leaving it in a less nauseous and noxious state; but, after many experiments undertaken for the purpose of verifying this statement if possible, I can only conclude that, if fousel oil is decomposed in alcohol of less than 60° over proof, it is only by slow oxidation, and then it yields valerianic acid. As it has not yet been shown that valerianic acid is produced in the raw grain spirits by the decomposition of the fousel oil, and it is an undoubted fact that after a sufficient time fousel oil does eliminate itself from strong spirit, I am led to infer that this elimination is due, not to decomposition, but to the great diffusibility of the fousel oil in spite of its high boiling-point. It is strange, but perfectly true, that the greater power of diffusion possessed by many volatile compounds will slowly but surely separate them from others of far lower boiling-points. Hence, fractional distillation for the determination of different alcohols present together must always be conducted with a due observance of this fact, otherwise mistakes are liable to arise which may condemn alike an insufficiently careful analysis or a moderately wholesome spirit.

How long a period may be required to get rid of the fousel oil in raw-grain spirit must depend greatly upon the amount present in the first instance. I have found potato spirit highly impure from fousel oil after keeping for more than twenty years. A sample of raw-grain whisky and another of low French brandy, both containing fousel oil, and both being reduced in strength to 22° under proof, stood in my laboratory for four years without any sensible diminution of their noxious constituents, but it is possible that the glass-stoppered bottles in which they were kept prevented the evaporation of the amylic alcohol, which might have transfused itself through an ordinary cork or the wooden staves of a barrel.*

It might be thought that the great expense incurred in keeping raw-grain spirit, or indeed, the newer distillates of malt and grain, unless specially treated, until the fousel oil is removed, would render in the end the production of such spirit as expensive as that of pure malt, and this would probably be the case if the ingenuity of trade had not found out that the disgusting flavour and fetor of fousel oil in spirits can be covered and blended with other flavours so as to disguise its presence when the quantity of fousel oil in the spirit has been reduced somewhat by a few months' keeping. Coarse Irish whiskies are chiefly flavoured raw-grain spirits, of which a vast amount is sent from Scotland. Many of the strong-tasted Scotch whiskies, which simulate the true smoke-twang of the peat-dried malt, are in reality raw-grain spirits with a fictitious flavour imparted by an almost infinitesimal addition of creosote or crude pyroligneous acid. So much of the whisky sold is contaminated with fousel oil that the temporary frenzy, the murderous insanity, and the brutal ferocity of the immoderate imbibers of this vile liquor can hardly be wondered at, attested as it is by the records of every police court. Still there are whiskies to be procured from reliable sources which are as free from fousel oil as is the finest French brandy; and, being also free from the astringency which gives the chief medicinal value to good brandy, are the more suitable for general consumption. In fact, we have only to assure ourselves that whisky contains only the minimum of amylic alcohol, and that in strength and flavour it is agreeable to the palate, and we may fairly consider that we have before us the most wholesome and least deleterious of all the products of distillation.

In searching for characteristic samples of whisky to illustrate this point, I have been fortunate in procuring two excellent types of the result of widely different processes of elimination of fousel oil. The first, obtained from Mr. Francis Falkner, is that very rare article of commerce, a real Irish malt whisky, of from seven to ten years old. The fractional analysis proved that, in this instance, any fousel oil originally present had been most effectually driven off by long keeping. I do not know whether I should be justified in asserting that no Irish whisky except from one distillery in Ireland fulfils this most important requirement; but, of the many samples of whisky purporting to be Irish, there is only one that I have found free from very considerable quantities of fousel oil of the worst possible type. The other sample is, to me, a novelty of

* The distillation of malt is not to be accepted as freed from this component by the ordinary processes.

great interest. A Scotch whisky boasting that it is freed from fousel oil, by the perfection of the peculiar process of distillation. To arrive at any such result two conflicting difficulties have had to be overcome in the removal of the fousel oil, and in the retention of the more delicate ethers. If the latter had been removed as might have been anticipated, along with the fousel oil, a fine pure spirit of wine would alone have been left. As the flavour of the sample was altogether unobjectionable, I was induced to devote more than usual attention to its fractional analysis, and I was surprised to find that this whisky contained less trace of fousel oil than any spirit used for drinking that I have ever submitted to the same searching investigation. Messrs. Bernard and Co., of Leith, in reply to my inquiry concerning the sample purchased, inform me that they will guarantee all whisky distilled by their new process to be equally free from this deleterious and poisonous matter. If the purity of the whisky so obtained does not enhance to any great extent the cost of the production of so wholesome a stimulant, I can see no reason why the consumers and dealers should not insist upon all whisky being equally free from fousel oil; and, in this particular, the medical profession should at least recommend to their patients no whisky which does not come up to the highest possible standard.

METROPOLITAN OPEN SPACES.

BY FRANCIS GEORGE HEATH.

I.

The Hackney Commons.

IN the north-east of the metropolis there is a group of open spaces, which have been allowed by the authorities under whose care they have been placed to fall into a condition of neglect. The authorities in question are the Metropolitan Board of Works, and the open spaces to which I refer are known under the designation of 'The Hackney Commons,' including the 'London Fields,' the 'Hackney Downs,' the 'Well Street Common,' 'Stoke Newington Common,' 'Clapton Common;' a piece of land called the 'North Mill Field,' another called the 'South Mill Field,' and certain other portions of land near Dalston Lane and Grove Street. These commons, although the area of each is not very large, together cover a somewhat considerable extent of ground. Excluding the Hackney Marshes, the total area would be more than half that of Victoria Park. Something could, no doubt, be done to improve the condition of the Hackney Marshes. But my present paper has reference especially to the other Hackney Commons which are enumerated above, and which have been placed under the control of the Metropolitan Board of Works. They serve most usefully as 'lungs' for the large district in which they are situated, and their preservation is therefore essential to the health of the inhabitants.

Especial attention has recently been directed to these Hackney Commons in consequence of the conduct of the Lord of the Manor in enclosing portions of one of them—the Hackney Downs—and digging and removing the subsoil. It has been surmised, and perhaps rightly, that the object of the Lord of the Manor in taking these proceedings is really to force the Metropolitan Board of Works to purchase the manorial rights over the Hackney Downs, and to settle the terms under which this open space is to be enjoyed by the public. But the action, as will be supposed, is not taken in the interests of the public, or otherwise the enclosure of this common in places, and its disfigurement by digging in other places, would not have been accomplished. In fact, in regard to commons in general, the Lords of Manors are the sworn enemies of the public so far as the exercise of commoners' rights is concerned.

Perhaps it is from the fact that the Lord of the Manor is the richest, and therefore practically the strongest of the various owners of real or imaginary rights over the Hackney Commons, that he has ventured to try the validity of his rights. The Metropolitan Board of Works have commenced proceedings against this individual, but meanwhile the enclosures continue, and the gravel-digging goes on uninterruptedly.

In the case of Stockwell Green, it may be remembered that when its enclosure took place, and building operations were commenced by the supposed owners of the soil, an injunction was obtained by the plaintiffs in the legal proceedings which were instituted to restrain the enclosers of the green from going on with any buildings pending the settlement by the Court of Chancery of the legal question involved in the case. The Metropolitan Board of Works have not thought proper to pursue a similar course in respect of the Hackney Downs; the digging and removing of the gravel of this common are still going on, and if these proceedings cannot be stopped in a short time the surface of the ground will be destroyed. In fact, there appears to be nothing to prevent the owners of real or imaginary private rights in or over the other Hackney Commons from serving them in the same way as the Hackney Downs are being served. Many of these miscellaneous 'owners' allege that they are entitled to dig 'minerals'—*i.e.*, the subsoil—from the commons. Some of them appear to refrain from doing so from fear of the Metropolitan Board of Works, and from disinclination to engage in legal conflict with so strong a body, supported as it is by the ratepayers' money. Others, perhaps, are waiting for the Metropolitan Board to take the initiative. Yet it is most undesirable that the various questions in respect to these commons should remain in their present unsettled condition. The fact that they are so left would probably furnish the excuse of the Metropolitan Board for having done next to nothing in the direction of laying out and planting the commons in accordance with the scheme proposed by the board itself, and certified by the Enclosure Commissioners so long ago as the early part of 1872.

The action of the Enclosure Commissioners in regard to the Hackney Commons is regulated by the Metropolitan Commons Act of 1866, under the provisions of which the commissioners are prevented from sanctioning any scheme of enclosure relating to any of the commons within the Metropolitan district. Such being the law, it became the duty of the commissioners in 1871 to decide what should be done with the Hackney Commons, and how they should be utilised as open spaces for the enjoyment and recreation of the public. They accordingly in that year held meetings at Hackney to inquire respecting the preservation of the commons in the district. But through what appears a

very strange oversight, it was found when their next annual report was issued that no mention at all was made of the Hackney Commons. Fortunately, however, the omission was rectified without much difficulty, and by the following year the commissioners had certified the scheme, to which reference has already been made, for the management of the commons. They were under this scheme to be placed under the control of the Metropolitan Board of Works, and that board was authorised to lay out and beautify the grounds, to drain them, raise or level them where necessary, to preserve any trees, shrubs, plants or grass that might be on them, or to plant with trees, shrubs, etc., when required. The board was further to appoint a staff of officers to take charge of the commons, and it was to frame by-laws for the preservation of order, etc. Whilst it was not to be allowed to do anything that would affect the natural features of the commons, the board was authorised to take means to prevent illegal trespass or enclosure.

Now it is no doubt the fact that the board has in a desultory sort of way done something in discharge of its duties in respect of these commons. There has been a little planting, and sowing of grass seed. But although three years and a half have passed since these open spaces were placed under its control, the improvement has been so slight as to be almost imperceptible; whilst some of them instead of being smiling gardens, as they ought to be, are more like 'howling wildernesses.' For its own credit it is to be hoped that the Metropolitan Board of Works will lose no more time in properly discharging its duty in respect to these commons.

THE

SANITARY RECORD.

SATURDAY, NOVEMBER 20, 1875.

TO SECRETARIES OF SANITARY ASSOCIATIONS AND KINDRED SOCIETIES.

The Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers read before the members of any sanitary or kindred association.

ADVOCATUS DIABOLI.

IMMEDIATELY after the passing of the 'Sale of Food and Drugs Act,' and long before its provisions were either known or understood by the public, and before it actually superseded the 'Adulteration of Food Act, 1872,' Messrs. G. W. Wigner and J. H. Scott performed the laborious task of writing a careful *résumé* of the two laws, showing in what points they differed, and in what respects they were identical. This paper being a valuable contribution to the comprehension of a most important Act, we printed it in full on September 11, for the benefit of those interested, who had not had the same opportunities as the writers for an exhaustive study and comparison of the two Acts, side by side.

The paper was afterwards published in pamphlet form, and has been favourably reviewed by various scientific and hygienic journals, and as it did not partake in any degree of a controversial character, and as its conclusions have never been questioned, still less controverted, it did not appear to us open to hostile criticism.

In this, however, it seems we judged hastily, and without making sufficient allowance for the idiosyncrasies of some journalists. There is published in London every week a vigorously conducted trade journal bearing the title of *The Grocer*, and representing, as its name denotes, the important interests of the breakfast-table.

This journal, after 'nursing its wrath to keep it warm' for a period of nearly two months, indulged in its issue of the 6th inst. in a violent philippic against the very inoffensive pamphlet to which we have referred.

The animus of the article may be guessed by its genial and elegant heading, 'Analytical Tomfoolery.' It commences with a statement which is a happy blending of misrepresentation and audacity. 'We have always shown the partial and interested views of the analysts; how these gentlemen have only one object—viz., their own pecuniary benefit, not the good of the public, and how they desired that the new Act should be so framed that their own interests should be secured at the expense of the interests of the tradesman.'

Most of our readers will be able to estimate correctly the value of this nonsense, but as there may be an idea amongst some uninformed persons that it is the analyst's interest to get as many convictions as possible, it may be worth while, once more, to repeat the statement that such a view is entirely erroneous. The public analyst's duty is purely scientific. He does not know the shopkeeper whose goods he is called upon to examine, nor does he want to know him; and if the sample is found to be adulterated, it is the reverse of a pleasure for the analyst to have to leave his laboratory in order to give evidence against the peccant tradesman.

We learn, as we read further, that not only does the *Grocer* think very little of the Society of Public Analysts 'as a corporate body,' but that its 'opinion of the members individually could not be much lower than it is.' This is extremely sad, but perhaps not unnatural, since the *Grocer* seems to consider that its mission is especially to espouse the interests of dishonest traders. The defendant is rarely in love with the plaintiff's witnesses, and it is not unusual for the accused to say hard things of his accuser. We feel very sure that the 'trade' generally will consider itself misrepresented by its advocate. Honest traders welcome the public analyst as the representative of truth.

It further appears, according to this fair and courteous critic, that 'the analysts show the same all absorbing desire—greed,' and that they care not what the 'respectable' (though erring) 'trader' may suffer so long as they 'pocket their fees.'

Under the old Act, private samples, *i.e.*, samples others than those purchased by the officers appointed, had to be taken to the inspectors, by whom they were submitted to the analyst. The new Act allows private persons to take samples direct to the analyst, and as it appeared possible that under this arrangement tradesmen might take advantage of the Act to get analyses made for advertising purposes, Messrs. Wigner and Scott remarked, 'This alteration is very unacceptable to some analysts, who fear they will be flooded with private samples at low fees.'

The writers themselves, in the next sentence, disclaimed any participation in such fear, which they characterised as 'exaggerated, if not groundless.' This, however, is not sufficient for the *Grocer*. It italicises the words 'low fees,' and waxes virtuously indignant at the idea of an analyst thinking of his fees at all, it being, as is well known, the rule for the *Grocer's* clients to sell their wares at cost price, except in the numerous instances in which they refuse payment altogether.

Under the Act of 1872, when an inspector purchased a sample he took it intact to the analyst. It was then divided, the inspector retaining one part. By the Act of 1875 it is ordered that the sample shall, at the time of purchase, be divided into three parts the vendor, the purchaser, and the analyst each having one. The writers of the pamphlet admitted the fairness of the vendor's having one portion, but pointed out that as the analyst would only see one-third of the sample, it was very desirable that he should insist upon the quantity of the article purchased being sufficiently large to admit of there being enough of his portion left, after completion of his analysis, for a second examination, if, in his own defence, it should be desirable to have one made.

The *Grocer* is aghast at this suggestion, and insists upon knowing whether it is prompted by 'impudence or ignorance;' but, without waiting for a reply, it naïvely remarks that 'there are already two other parts of the sample in reserve,' adding, with a delicious gush, suggestive of the proud possession of a sixpenny phrase-book: 'Therefore, Monsieur Analyst, *que voulez vous?*'

Various reasons were pointed out for extreme care being taken to preserve the identity of a sample, and, amongst other things, our authors remarked:

'Inspectors, too, are not usually so expert at tying up parcels securely as are shopkeepers, and if the parcel is only clumsily secured, the difficulty would not be great, and the temptation to a vendor who knew he had sold an impure article would be considerable, to substitute another sample of different quality.

'But, beyond this, there is the possibility of such a thing as collusion between an inspector and a shopkeeper, in which case the reputation of the analyst would be in considerable peril.'

This is the last straw which breaks the critic's back. On behalf of 'the trade,' he 'indignantly repudiates the idea that there would in any case be any tampering with samples.'

This omniscient but slightly frantic person thus actually goes bail for the honesty of every individual grocer in the three kingdoms! But not only is it rank blasphemy to assume an occasional lapse from virtue on the part of any member of 'the trade,' but to hint at the bare 'possibility' of collusion between an inspector and a tradesman is 'a gross libel.' It appears as if 'the trade' whom the *Grocer* so unwisely represents were, in its opinion, like Napoleon's old guard, 'they may adulterate, but they will never collude.'

There is, however, one precious grain of wheat in this otherwise abominably bad bushel of chaff. After making a microscopical examination of the obnoxious pamphlet, the *Grocer* has actually discovered a grammatical error. We do not know whether the authors or the printers are responsible, but there is no denying the gravity of the fact that, in an instance which the *Grocer* gleefully points out, a word appears in the singular whereas it should have been in the plural. Such a slip is deeply to be regretted, but our grief is somewhat assuaged by the cheering reflection that the School Board must indeed be doing good service when this obscure advocate of adulteration champions the Queen's English. The poor fatigued *Grocer* winds up its article by saying that 'it is absolutely wearisome to wade through the mass of twaddle and misrepresentation,' and so 'with a sigh of regret' it consigns the offending pamphlet to the 'waste-paper basket.' What a fate! Can a lower depth be imagined? And yet as abuse from some people is preferable to laudation, it is just possible that Messrs. Wigner and Scott may prefer the ignominy of the *Grocer's* wastepaper basket to the most honoured place on its library shelf.

METROPOLITAN IMPROVEMENTS.

THE Works and General Purposes Committee of the Metropolitan Board of Works have brought up a report on the scheme for reconstructing the unhealthy dwellings adjoining Gray's Inn Road. The official representation of the medical officer of health for Holborn was referred to the engineer and architect of the board, and they recommended the widening of Gray's Inn Road as part of the scheme (which is clearly not within the meaning of the Act), and the removal of the buildings on an area of ten and a a-half acres. As Reid's brewery, public washhouses, St. Alban's church and schools, and a number of houses not in a bad sanitary condition, altogether

occupying nearly three acres, are situated on this area, the committee recommended the board to deal with four acres only, or thereabouts. They also advised that certain houses in Leather Lane, Gray's Inn Road, Brook Street, and Portpool Lane, as well as other buildings, should be taken down to widen the existing approaches to the unhealthy area, although they could not otherwise have been included in the scheme. They also recommended that a thoroughfare through Bell Court and Brook Court should be widened to twenty feet; that three narrow carriage ways should be widened to thirty feet each; a new street, thirty-five feet wide, formed in continuation of Greville Street; and the formation of a new street forty feet wide, from Leather Lane to Gray's Inn Road. These improvements are estimated to cost approximately 64,000*l.*, after sale of the land not required for streets. The Metropolitan Board has been severely animadverted upon for not sanctioning the larger instead of the smaller scheme, but as the latter proposes to open up the whole area sufficiently for ventilation, by the widening of old thoroughfares, the formation of new streets, and opening communications between the church, schools, washhouses, and model lodging-houses, we do not see why the Board should be blamed for this course. It must be remembered that the Artisans' Dwellings Act was not passed for widening streets which are too narrow for the traffic, but for the purpose of enabling local authorities to pull down houses, courts, and alleys, and other parts of cities and boroughs, which by reason of the want of light air, ventilation, or of proper conveniences, or from other causes, such as the closeness, narrowness, and bad arrangement or conditions of the streets and houses, are unfit for human habitation, and thus cause death or loss of health from fevers or other diseases generated therein. Such being the law, and the official representation being necessarily based thereon, the Board can only include neighbouring lands, houses, and other premises, if in their opinion such inclusion 'is necessary for making their scheme efficient for sanitary purposes, or for widening any existing approaches to the unhealthy area, or for otherwise opening out the same for the purposes of ventilation or health.'

We have made these extracts from different parts of the Act to show its essentially sanitary character, and assist in preventing unnecessary opposition to the course which the Metropolitan Board is pursuing. It must also be borne in mind that the rules laid down in this case for carrying out the Act will, to a certain extent, establish the plan of future action, so that whilst a too limited scheme will not be satisfactory to the public or conduce to the reputation of the board, its undue extension will add enormously to the cost, and probably prevent other schemes from being properly dealt with. The real question at issue is whether or not the report and plan just adopted by the Board will remove every unhealthy dwelling in the area, and make such streets and approaches to the area as will be sufficient for sanitary purposes. If the plan will do so, it is all that is necessary; if not, it should be extended so as to carry out fully the letter and spirit of the Act. The committee say that it does, whilst the objectors state that it fails to provide sufficient space for the number of artisans and labourers now residing on the spot. In our opinion, the three acres or thereabouts of building ground which will be at the disposal of builders under the proposed plan, will be amply sufficient for the erection of blocks of buildings, capable of housing all those who are evicted, and allow plenty of space for ventilation and the erection of all necessary sanitary conveniences.

The course which the Metropolitan Board of Works have taken as regards the official representation of the medical officer of health for Whitechapel corresponds with the above, as they have not only agreed to carry out the Act as regards the area reported upon, but as regards a plot of ground situated in the parish of St. George's in the East, on receiving a representation from the medical officer of health for that district to the effect that the area is unhealthy. They will thus include parts of two parishes in one scheme, and obtain the largest amount of sanitary improvement at the smallest possible expense.

Notes of the Week.

A SOCIETY has just been formed in Melbourne, called the 'Australian Health Society.'

MR. JOSEPH CHAMBERLAIN has been elected Mayor of Birmingham for the third time.

SIR J. HOGG has been re-elected Chairman of the Board of Works for the ensuing twelve months, at a salary of 2,000*l.*; which is an increase of 500*l.* upon that of the previous year.

THE Worshipful Company of Carpenters have unanimously voted the sum of twenty-five guineas for the promotion of technical education in the Artisans' Institute, St. Martin's Lane.

IT has been decided to erect in Dulwich a trough and drinking fountain as a testimonial to the public services of Dr. Webster, J.P., Chairman of the South Metropolitan District School.

MISS FENWICK MILLER is delivering a series of four lectures on 'Simple Sanitary Science,' at the Town Hall, Tamworth, under the auspices of the Rev. Brooke Lambert, vicar of Tamworth.

DURING the year ended in August last, 432 dead bodies were removed to Marylebone Workhouse dead-house from various parts of the parish by inmates of the workhouse. The guardians have passed a resolution to the effect that the present system is very objectionable, both as regards the employment of pauper labour and the bringing of so large a number of dead bodies, many of them in various stages of decomposition, in contiguity to the infirmary wards.

TYPHOID fever prevails so extensively at Crediton, Devonshire, that the leading inhabitants have presented a memorial to the local board, praying them to take immediate and prompt measures for the suppression of the outbreak.

DR. TIDY, the medical officer of health for the parish of Islington, has reported to the sanitary committee of the vestry that he deems it desirable to have the provisions of the Artisans' and Labourers' Dwellings Act applied to 306 houses in the parish.

THE Improved Industrial Dwellings Company have leased a large site adjoing the Chelsea barracks at Pimlico, and one containing more than an acre of land, between Upper Street and Liverpool Road, Islington, on which they propose to raise model lodging-houses.

SIR J. HOGG, the chairman of the Metropolitan Board of Works, is reported by Mr. Munk, M.P., to have told him that such is the activity under the Artisans' Dwellings Act in framing new schemes, that 'his life is a burden to him.' While deeply commiserating the excellent chairman of the board, we should be sorry to see him relieved of the burden; and Mr. Cross must be affected with a strange mixture of emotion in condoling with the gallant Colonel on the success of his measure.

STATE MEDICINE.

THE next examination in State Medicine at Cambridge will begin on Tuesday, June 13, 1876. Any person whose name is on the *Medical Register* of the United Kingdom may present himself for it, provided he is twenty-four years of age. Information respecting the examination may be obtained by application to Professor Liveing, Cambridge.

PRIZE ESSAY ON RURAL SANITARY SCIENCE.

THE prize of twenty-five guineas offered for open competition, in January, 1875, for the best essay on the following subject, 'The Application of Sanitary Science to Rural Districts, with a view to insure the highest Condition of Health and the Prevention of Disease,' has been awarded to Mr. C. F. Gardner, Ashbourne, Derbyshire. This gentleman carried off the prize from eighteen competitors.

LONDON MORTUARIES.

THE Clerkenwell Vestry have at length arranged with the agents of Lord Northampton for the site of a mortuary in that parish, and the plans have been approved and a committee appointed to carry them out. They include a coroner's court-room, *post-mortem* room, and disinfecting oven. On the other hand, at Bethnal Green, 'owing to the consternation caused by the sudden death of Dr. Sarvis,' the erection of a mortuary has, by vote of the vestry, been 'left in abeyance.'

THE SMITHFIELD CLUB CATTLE-SHOW AND THE FOOT AND MOUTH DISEASE.

IN order to prevent the possibility of contagion being spread through the medium of this congregation of animals, it has been ordered that no animal exhibited at any other show within one month previous to December 3 will be allowed to be exhibited at the Smithfield Club Show this year, and each exhibitor is required not only to deposit a certificate to that effect, but also one with each animal that it has not been for fourteen days previous to its leaving home for the Smithfield Club Show in contact with any animal suffering from contagious or infectious disease. And further, that all animals shall undergo a veterinary examination previous to entering the doors of the Agricultural Hall, suitable covering being constructed over the outer yard to enable this to be properly carried out.

PARISH MORTUARIES.

AT the meeting of the Strand Board of Guardians, the motion for the appointment of a deputation to wait upon the president of the Local Government Board regarding the establishment of public mortuaries in the metropolis, to which reference was made in the SANITARY RECORD, no. 70, p. 325, was carried. This much-needed reform is thus brought one step nearer to realisation.

FOOT AND MOUTH DISEASE.

THE Leicestershire Chamber of Agriculture has passed resolutions declaring that the ravages made in the present year by foot and mouth disease prove that the Contagious Diseases (Animals) Act has failed to accomplish its object: demanding the slaughter of all fat stock at the port of debarkation and the detention for some days of all store stock, and recommending that for the first two months of next year no cattle should be removed from a farm except by license.

IMPROVEMENTS IN THE EAST-END.

AT the last weekly meeting of the Metropolitan Board of Works, the Works Committee recommended that the wretched dwellings of a population of 3,700 Irish labourers, situated on six acres of ground, between St. Katherine's Docks, Upper East Smithfield, and Royal Mint Street should be removed, and that the area should be crossed by a number of wide streets. The cost of this improvement, including 10,500*l.* for the formation of roads, is estimated at 54,400*l.*

THE HANLEY PUBLIC BATHS.

THE success which has attended the opening of these baths is very encouraging. The men's portion was opened in April, 1874, since which time the receipts have exceeded the working expenses by 200*l.* During the year ending August 31 there were more than 40,000 bathers. The women's section, which includes a swimming-bath, was opened on the 9th inst. The building has cost 10,200*l.*, and it is calculated that a rate of less than one penny in the pound will be sufficient to meet the loan-charges.

A NEW SOLUTION OF THE SEWAGE DIFFICULTY.

WE should scarcely look, says the *Daily News*, into a prison report for a suggestion as to a settlement of the sewage difficulty. Nevertheless, it is proposed in one of the Government reports from Pentonville that convicts, or discharged prisoners, who are destitute, should be employed in the requisite works for diverting the sewage of towns from the rivers. To the convicts is to be assigned the more disagreeable part of the work, while the less irksome or offensive part should be allotted to the discharged prisoners who choose to undertake it. 'Engineers and chemists' are to devise the mode of action, and the judicial and police authorities are to organise the labour.

MUNICIPAL HOMICIDE.

MR. SHONE, of the Wrexham town council, has been at great pains to convince his colleagues that they are guilty of the slaughter of seventy-six of their fellow-creatures every year, at an annual loss to the community of over 3,000*l.* Dr. Farr estimates that for every death there are twenty-eight cases of sickness; Mr. Shone, to be quite within the mark, puts them at twenty-five; he takes the figures of the same eminent authority in computing the loss, by death, of the value of labour over and above the sum required for maintenance; and he puts the cost of each case of sickness in medical attendance, loss of time, etc., at 1*l.* This mode of computation is likely to be effective in dealing with improvements requiring immediate money payments.

THE DUBLIN MAIN DRAINAGE SCHEME.

THE last intelligence concerning this much wanted and much opposed scheme is that an injunction has been filed in the Court of Chancery to prevent the Corporation from proceeding with a bill for which they have given notice next session, and to hold certain members responsible for expenditure already incurred. The bill alleges as the ground of complaint that the notice required by the Towns Improvement Act of 1849, which is incorporated with the Dublin Improvement Act, has not been given, and the proceedings already taken are illegal.

GREEN BALL-DRESSES.

DR. WHITMORE has very recently analysed the colouring matter contained in four pieces of tarlatan, a material worn by ladies as evening dresses. Two of the pieces were of a bright green colour, the other two of a pale or apple green. Those of the bright green colour contained arsenic in considerable quantities; one of the pale green contained a minute trace of it, but in the other none could be detected. He has been induced to make these analyses from its having been reported to him that two young ladies had suffered from symptoms of arsenical poisoning in consequence of having worn dresses of this description at an evening party.

ABSTRACTION NO THEFT.

IT is rather unsatisfactory news for milk-drinkers, that according to a recent decision of the sitting magistrate at Westminster, the provisions of the new adulteration Act, constituting abstraction of cream an offence, may be nullified if the milk-seller chooses to plead that he has only 'abstracted by continual dipping.' In this case it was agreed that 'one-third of the cream had been abstracted;' but as the defendant pleaded that by his mode of selling the milk it had been virtually added to the milk supplied to her first set of customers, the summons was 'dismissed with costs.' All the same, this is rather hard on the second set of customers, who have to drink impoverished milk under the sanction of the very law which was passed to protect them against that contingency.

SALTING THE PUBLIC ROADS.

WE are pleased to find that in certain metropolitan districts permission has been accorded by the respective vestries to apply salt to the roads in the event of frost or snow, and that there is a prospect of a great reformation taking place in the condition of London thoroughfares during the approaching winter. In this matter Holborn, Bethnal Green, and Islington have led the way; and we learn that the St. Pancras Vestry has recently followed in the same direction.

In other quarters there is much opposition to the project, and the opposition has assumed a scientific or quasi-scientific character. The objection to salting is that a freezing mixture is thereby generated; and that the cold would be intensified. We cannot, however, help thinking that this objection is urged by persons who have only read of freezing mixtures, but have never worked with them, and certainly never studied them. It is a practical fact in the management of freezing mixtures, that a considerable mass of the material is requisite in order that the depression of temperature may be realised. If the freezing mixture, instead of forming a compact mass, be spread out in a thin layer, it is rendered ineffective through communication of heat from neighbouring objects, and although a certain number of units of heat are absorbed, yet only the most trifling depressions of temperature occur. If a road were salted, and then exposed to a shower of snow, we apprehend that, although the snow might be thawed as fast as it fell, yet the temperature of the road-surface would not sink to any appreciable extent; and we recommend that the comfort of being without snow be fearlessly enjoyed.

COMBINED SANITARY DISTRICTS IN WALES.

A MEETING of the sanitary authorities of the districts comprised in the several poor-law unions in Carnarvonshire has been held at Bangor, to consider a proposal that these districts should be combined under an order of the Local Government Board, in pursuance of sec. 286 of the Public Health Act, for the appointment of a medical officer of health. Mr. Andrew Doyle, the Local Government Board inspector, having fully explained the proposed scheme, Captain Verney proposed a resolution 'That it is desirable that the whole of the Carnarvon, Bangor and Beaumaris, Conway, Pwllheli, Llanrwst, and Festiniog Unions, including the urban authorities situated therein, be united into a district for the appointing of one officer of health under the 286th section of the Public Health Act, 1875.' The motion was carried by fifteen votes against nine.—The Ruthin board of guardians have unanimously passed a resolution, pursuant to the section referred to, that a representation be made to the Local Government Board, that it would conduce to the more efficient administration of the Public Health Act if the several sanitary authorities in the county of Denbigh were combined for the appointment of one medical officer of health.

EXPERIMENT IN THE TRANSPORT OF FOOD.

MONSIEUR TELLIER, whose researches in connection with the application of cold to the preservation of food are well known, has informed the *Académie des Sciences*, that he has purchased a vessel called the *Frigorifique*, of about 900 tons burden, which is being fitted up specially for the transport of food and other organic matters preserved by cold. In an experimental voyage to the River Plate, she will have a cargo composed of wine, beer, butter, cheese, yeast, hops, vegetables, etc., and other things affected by heat, which, up to the present time, it has been impossible to convey across the tropics in a good condition. On the return voyage the *Frigorifique* will bring back a cargo of fresh meat, game, fruit, skins, silkworms, eggs, etc.; in fact all sorts of productions which abound there, and which hitherto have not been attainable in this country in their fresh condition. Thus the solution of a great problem will be made by this expedition on a large scale, and Monsieur Tellier offers to the Academy facilities for any committee named by them to try any experiment in their discretion they may think desirable, and he places the appliances of the ship during the voyage at their disposal.

FUNERAL REFORM.

MR. SEYMOUR HADEN'S principles of interment received a practical illustration at Burton-on-Trent a few days since, when a funeral took place, carried out according to his plans. According to the *Derby Mercury*, 'the funeral was characterised by the extremest simplicity, there being no hearse, mourning-coach, pall, hat-bands, scarves, or any of the usual outward display. One of the wicker grave-baskets of Mr. Kirby, of Derby, was used on the occasion. This had been decorated with ferns, evergreens, flowers, etc., by members of the deceased lady's family, and its appearance as it was lowered into the grave was most graceful. In the morning the body was taken to the cemetery by two of the servants on an ordinary hand-hearse, and placed in the chapel. At twelve o'clock the mourners and friends arrived in their own carriages, and the first part of the solemn service of the Church of England was read. At the close, four of the servants carried the corpse to the grave, followed, of course, by the mourners. Here the service was concluded, the spectators all joining with subdued voices in the Lord's Prayer.'

THE INFLUENCE OF SEWAGE ON FISH.

IN a late report of the Nantwich Board the sanitary surveyor, Mr. J. A. Davenport, pointed out how at Burley-

dam the particular influence of sewage upon fish has been observed by him, and it appears that whilst fresh sewage is even beneficial, fermented sewage is fatal to piscine life. This is a very interesting fact to know, and should be noted by all who are similarly circumstanced. At Burley-dam a gentleman cultivates and takes considerable pleasure in the trout that may be found in a little stream adjoining his residence; above, however, there is a large farm with a covered tank, into which all sewage but the slops and part of the piggery drainage is piped. These latter run somewhat nastily and openly into the brook, and from the tank it appears there is an overflow drain also into the brook. While, however, the trout appear to feed on the fresh sewage, the fermented sewage out of the tank, which is passed at particular times into the brook, has a most deleterious influence upon them, and numbers of their bodies, after an excessive overflow, may be seen floating upon the surface of the water. It would be still more interesting to know of what disease the trout died, and how the liquid sewage affected their organism.

THE KEIGHLEY BOARD OF GUARDIANS AND VACCINATION.

AT the last meeting of the Keighley Board of Guardians, the clerk reported that he had received between fifty and sixty letters in reply to the circular and memorial sent by that board to the various boards of guardians in the country, soliciting sympathy and support in securing the repeal of the Vaccination Acts.

Many declined to assist the Keighley guardians in getting the Acts repealed, believing vaccination to be eminently beneficial. Among these were the following unions: Skipton, Lancaster, Woolwich, Forden, St. Thomas, North Dublin, South Dublin, Toxteth Park, Church Stretton, Appleby, and Wandsworth and Clapham. The Halifax board considered the memorial unworthy of consideration. The Billesden (Leicestershire) guardians, expressed a hope that the Keighley board was the only board in the country entertaining an opinion unfavourable to the operation of the Vaccination Acts. The Canterbury board looked upon the opinions of the Keighley guardians as erroneous and mischievous in the extreme. The Merthyr Tydvil board thought the members of the Keighley board were gone mad, and hoped the law would bring them to their senses. The chairman (an anti-vaccinator) said he also had received several letters in reference to the memorial. The York and Doncaster boards had ordered the memorial to be thrown under the table. The Salford guardians had resolved that the whole of the Keighley guardians were fit subjects for a lunatic asylum, and ought to be confined in one at their own expense. They considered a halfpenny for postage far too much to spend over such lunatics. The Gainsborough and Cheltenham boards, however, were more merciful; they had passed resolutions disapproving of compulsory vaccination. Notices of similar resolutions had been given by members of the Dewsbury, Walsall, and other boards.

LONDON ALE AND PORTER.

IT may conceivably be in the interest of the Brewers' Society to oppose any statement pointing out the excessive quantity of alcohol which a man imbibes in drinking two quarts of fourpenny ale, but it is quite incredible that any chemist of ordinary information should fail to perceive the ludicrous error implied in treating brandy sold at public-houses as synonymous with proof spirit. We might appeal, therefore, from Mr. Dugald Campbell, in his capacity of an official of the County Brewers' Society, in which he writes to the *Times*, to Mr. Dugald Campbell as a chemist, to correct the absurd error in his criticism of the article on London ale and porter quoted in the *Times* from the SANITARY RECORD. The RECORD stated as the result of 119 separate analyses of ale and porter sold over the counter by publicans in various parts of London, 'that a person who drinks a couple of quarts of fourpenny ale consumes more alcohol than is contained in half a pint of brandy or whisky.' Mr. Dugald Campbell says that this 'does astonish him.' And he adds that two quarts of fourpenny ale (containing say 7 per cent. of proof spirit) would give the amount of alcohol (query proof spirit) of rather more than five and a half ounces, instead,' he adds, 'of half a pint, which is ten ounces.' But he surely knows that the half pint of brandy contains not more than seven ounces of proof-spirit, while two quarts of fourpenny ale contain 7·2 ounces.

Whence, then, the astonishment of Mr. Campbell? Perhaps he will make this clear. The main object of the SANITARY RECORD, we may add, was not to announce a discovery, for the facts are of the most elementary character, but to diffuse this elementary knowledge amongst the technically uninformed classes, and to drive home the truth, which a long series of investigations have established, that prevalent drunkenness has rarely, if ever, the excuse which is so often made for it, that 'mysteriously intoxicating adulterants' have been added to beer, but has its root in the fact that beer contains a much greater amount of spirit than unreflecting people give it credit for, and that it makes them drunk because they drink a great deal too much of it.

ÆSTHETIC INFLUENCES.

THE decoration of the wards and grounds of asylums has been found to exercise a remarkable effect in improving the conduct and health of insane patients. This is interesting in many ways, and not the least interesting deduction is this, that if the proved effect of beautiful surroundings is to favourably modify the conduct and mental state of the insane, may we not feel sure that those are right who look for decidedly elevating and improving effects from improving the habitations and surroundings of the labouring poor? Those who say this and mean it, who go, for example, to the length of Mr. Ruskin, are sometimes looked upon as visionary enthusiasts. Let us take, however, as a plain statement of fact this little memorandum from a recent visitor to Munich:

'The insane asylum is worth seeing. The director has recently had one million guldens voted him, without a dissenting voice; for the purpose of enlarging and improving and beautifying his buildings and grounds. In all of his windows he is putting panes of *Spiegel-glas* (plate glass) about a centimètre thick; it cannot be broken by any ordinary blow. In fact, I could not break it with my fist. Each pane costs a gulden, an extravagance which the *Gehcimrath* from Hildesheim said that he had not seen even in England.

'Another excellent idea which I noted was the building of large rooms for exercise during stormy weather. The southern sides were almost wholly of glass, and the rooms were not to be heated. The sashes are to be taken out during summer, and the space occupied with plants, shrubs, etc. The superintendent is carrying rather far the principle of decorating the grounds and frescoing the wards and other rooms which are for the most demented patients; but he thinks his experience justifies him in saying that by such means he reduces his number of filthy patients seventy-five per cent.'

Is it not worth while to do almost as much for our sane brethren as for the insane? At any rate we may feel sure that clean houses, and open spaces, gardens, trees, open public galleries, and a general cultivation of beauty and brightness are as likely to affect favourably the character of the sane as of the insane. The observations of the director of the asylum at Munich are precisely in accordance with those of our best asylum managers, as, of Dr. Crichton Browne, at the West Riding Asylum; Dr. Lockhart Robertson, at the Sussex Asylum; and Dr. Langdon Down, at Earlswood. These observations, indeed, partake of the character of demonstrations.

THE PREVENTION OF INFECTIOUS DISEASES

IT is almost impossible to open the report of a medical officer of health without finding the just and important lament, that their present means of learning the existence of infectious disease in their parish is so defective that they are quite unable to take adequate steps to prevent the spread of such disease, and by opposing the beginnings to cut short an epidemic. 'It is my duty,' says Dr. E. West Symes, the medical officer of the combined Settle and Skipton Unions, '"on receiving information of the outbreak of any contagious, infectious, or epidemic disease of a dangerous character within the district, to visit the spot without delay, and inquire into the causes and circumstances of such outbreak, and advise the persons competent to act as to the measures which may appear to me to be required, to prevent the extension of the disease, and, so far as I may be lawfully authorised, assist in the execution of the same." But unfortunately, at present, there being no compulsory registration of disease, and nobody whose duty it is to inform me of such outbreak, very often the first intimation I receive is from the district-registrar, when there has been a death, and by that time the infection has often spread, and my interference is then of but little use. It is, I believe, of the utmost importance that some steps should be taken by Parliament by which medical officers of health should be immediately informed of the occurrence of infectious disease; and this is the more necessary as it is the first cases which are of the greatest importance, and then is the time when all steps for isolating the patient and using the various means in our power for disinfection, etc., should be taken; for (as was pointed out by Mr. Simon in his last annual report) the first isolated cases of epidemic disease almost invariably, if not checked by sanitary precautions, are the forerunners of a general outbreak, and in matters of sanitation, as in all others, any measures to be really effective must be precautionary.' This defect of the law deserves the immediate attention of the Local Government Board. It has from the first been foreseen. The arrangements for procuring information from the poor-law medical officers are very imperfect, throughout the country, and for knowledge of cases occurring in private practice, medical officers are entirely dependent on the voluntary courtesy of private practitioners.

Medical Officers' Reports.

Report on the Sanitary Condition of Kendal. By DAVID PAGE, Esq., M.D.

Report on the Ventilation and Flushing of the Sewerage System, Torquay. By S. RHIND, Esq., M.O.H. Tormoham Local Board.

Report on the Present Water-Supply of Tralee. By F. J. FALVEY, Esq., Sanitary Medical Officer, Tralee, etc.

DR. PAGE'S report is one which ought to be well studied by the people of Kendal, since no pains have been spared to render it an exhaustive and practical one. His remarks upon the sanitary arrangement of sinks and closets are perfectly sound, and he wisely suggests that the simplest course would be to abolish all inside sinks whatever, and fix properly trapped gratings, set in deeply dished stoneware sinks, outside the house altogether.

This might not, however, always be convenient, and he consequently furnishes some diagrams showing how the slop-stone pipes can be discharged disconnectedly over outside trapped grids. He also shows how the wastes of cellar sinks can be discharged in the open air over gully traps connected with the sewer. He advocates, moreover, the policy of placing all gully traps in yards and courts, and the increasing number of trough closets under the exclusive charge of the scavenging departments, who would be responsible for their constant inspection, proper repair, and continual cleanliness. His views of soil-pipe ventilation are also admirable, and he is not content with anything but a continuation of the soil-pipe up to the roof. He might have added that, in order to create a current in these pipes, a fresh air inlet pipe might be led into the soil-pipe above the trap, but what he does recommend is in every way correct, and we hope that his strictures will receive the attention which they merit. Whilst advocating earth-closets under certain conditions, he, nevertheless, recommends the adoption of the improved trough water-closets for courts, where it is impossible to provide separate conveniences for every dwelling, and here he follows the lead of Drs. Parkes and Sanderson in their official report on the sanitary condition of Liverpool. In an appendix appears some plain rules which he has drawn up for the prevention of the spread of infectious diseases, and it would be well were handbills of this description freely handed about in all towns where small-pox, scarlatina, typhoid fever and diphtheria have broken out.

Mr. Rhind's report is a very short but thoroughly practical sketch of the dangers which result from sewer-gases. Prominence is given to the idea that sewer-gas is mainly evolved from that portion of the wall of the sewer which is, so to speak, between high and low water mark. This, and the filthy condition of the crowns of some sewers where the moisture condenses, are, he thinks, sufficient to account for the great spread of the active agents of putrefaction. The forces which operate in sewers, and which lead to the forcing of our common bell-traps and even closet syphons are brought into operation by the pouring into the drains and sewers of heated water or waste steam, by the difference of the temperature of the air in a close house to that of the drains, and also by the variation of the general external temperature of the air to that of the sewers. The remedy for all these evils are also pointed out, and epitomised under the heads of ventilation and flushing. By ventilation he includes all that has hitherto been pointed out as efficient in diluting the air of the sewers, or subjecting it to the action of oxygen before it escapes up the shafts of manholes and gullies. By flushing, he does not mean that partial kind which merely passes obstructions lazily onwards, and leaves behind slime and filth, but rather a sudden rush of water delivered with such force as thoroughly to cleanse out the sewer and drain from invert to crown. The only doubtful recommendation in the whole paper is that of providing valve-traps on the sewer side of water-sealed gullies in order that the pressure from the sewer should close the valve. If by this pressure is meant a pressure of sewer-air, this will, we consider, never operate sufficiently to close the valve; besides, to be a valve at all, it ought always to be closed, unless when it is opened from the street side by the passing into the sewer of storm or other water. We cordially commend this brief paper.

Mr. Falvey has done good service to the Tralee urban and rural districts by drawing attention to the present water-supply of Tralee, which is both short in quantity and very impure. The population of that town is about 10,000, and were the people supplied adequately with water, say with only twenty-two gallons each daily, at least 220,000 gallons would be needed. This quantity is the minimum that ought to be supplied for domestic purposes,—baths, water-closets and sinks; and there ought to be another margin of ten gallons extra supply for municipal purposes, such as street watering, fire extinguishing, and for trade accommodation, as for instance in engine-boilers and the like. But it appears that there are only seven town pumps in Tralee, which are worked twelve hours out of the twenty-four. Each pump yields daily about 5,400 gallons, or, to sum up, each individual in Tralee has a supply of one gallon of good water, two gallons of fairly usable water, and four gallons of water saturated with animal organic matter daily.

Mr. Falvey does not shrink in saying that the foregoing state of matters is desperate, but he does better than this,

he points out a remedy. He suggests the conveyance of water in pipes from the Curraheen River, which even in dry weather would amply supply the town with a soft, pure and wholesome water. Tralee is fortunate both in her sanitary medical officer and in her adjacent river.

THE LICENSED SLAUGHTER-HOUSES IN THE METROPOLIS AND THE NEW BY-LAWS.

CONSIDERABLE interest was manifested in the proceedings of the special sessions for the renewal of slaughter-house licenses in the Kensington district (which comprises the parishes of Chelsea, Hammersmith, Fulham, and Kensington). Our readers are aware that in virtue of the provisions of the 'Building Act, 1844,' the private slaughter-houses were to have been closed last year, but in consequence of urgent representations made by the butchers of the inconvenience likely to result from such a revolutionary change, for which no provision had been made, a select committee was appointed by the House of Commons in the session of 1873 to inquire into the whole subject of 'offensive trades.' The 'Slaughter-Houses (Metropolis) Act, 1874,' was the outcome of the inquiry. Under this Act the Metropolitan Board of Works was constituted the 'Local Authority' for the entire metropolis, excepting only the City of London and the liberties thereof, for the purpose of framing by-laws for regulating the conduct of certain businesses, including that of a 'slaughterer of cattle,' and the structure of the premises in which the businesses are carried on. No opposition was offered to the renewal of the license in Hammersmith, Fulham, and Chelsea; the interest of the proceedings therefore centred in the action taken by the vestry of Kensington, which was represented by Dr. Dudfield, the medical officer of health, as it was known that the vestry would object to the renewal of the license in cases where there was no entrance to the slaughter-house excepting over the foot-pavement and through a butcher's shop or a private dwelling-house, the difficulties of the 'middle passage' in some of these cases being increased by the fact that the 'cattle' have to go up stairs and down stairs to reach their final destination. The vestry had also resolved to oppose the license unless separate lairs or pens were provided for the temporary detention of the cattle, there being none such in the majority of the slaughter-houses, the lairs being actually within the slaughter-house, forming part of it, and obtaining their light and ventilation through the slaughter-house, contrary to the spirit of the by-laws.

Mr. Crouch, the solicitor to the Butchers' Protection Association, contended that as these arrangements were not forbidden by the by-laws, they did not constitute a valid objection to the renewal of the license. The magistrates, however, stating that Dr. Dudfield had made out a case, decided not to renew the licenses until an effectual separation had been made between the lairs and the slaughter-houses: while in respect of the slaughter-houses which have no independent entrance they resolved, on the medical officer's request, to view the premises before giving their decision at the special sessions. From a report of the sanitary committee of the vestry, we learn that there were till lately forty-eight slaughter-houses in the parish of Kensington. In eleven cases no application for a renewal of the license was made. To seven slaughter-houses the vestry offered no objection. Six they objected to *in toto* on account of the bad approach through dwelling-houses, etc.; and in respect of the remaining twenty-four the magistrates fully supported the requirements of the vestry and their medical officer, to the no small surprise, apparently, of the crowded auditory.

INTELLIGENCE has been received of a very serious outbreak of scarlet fever at Bristol; the excess of mortality from this cause exceeded that of any other city in the United Kingdom; whilst the general death-rate last week gave an average of 35 to the 1,000.

Law Reports.

ABSTRACTING CREAM.

ON the 10th inst., at Westminster, Mr. Hugh Morgan, dairyman, of 13 Marsham Street, Westminster, appeared to an adjourned summons, taken out by the Westminster District Board of Works, for selling milk from which the cream had been abstracted without disclosing the fact to the purchaser. Dr. Dupré, the food analyst, said that more than one-third of the cream had been abstracted.—The defendant stated that the milk had never been touched since the cows were milked. The milk was pure, and if it lacked the ordinary amount of cream it was in consequence of the first customers getting the best of the milk and cream from the first dipping out of the bowl.—Dr. Redwood, analyst for the County of Middlesex, agreed with Dr. Dupré as to the component parts of the milk, but said that the cream had not been abstracted otherwise than by the continual dipping of the measure in serving customers. He had seen the cows of the defendant milked, and had taken the milk and gradually scooped it out with a measure and found, when half the bowl was empty, that the analysis of the remaining milk showed a diminution of cream to the extent spoken to by Dr. Dupré.—The summons was dismissed with costs.

COMPLAINT AGAINST A WATER-COMPANY.

IN the matter of the East London Water Company and Mr. J. Grimes, reported in the SANITARY RECORD of November 6, the matter was heard *de novo*, by Mr. Hannay, at Worship Street on the 11th instant. In the course of the arguments it transpired that the company had sold to complainant, at their office, a copy of the rules, etc., under which the water was to be supplied, and in court they repudiated this as not being correct. The rules were not stamped or certified by the Board of Trade, as required by the Act, which directed that such rules should be sold to all persons requiring the same. Further, it appeared that the company were required by the Act to give notice within forty-eight hours to the sanitary authority of the district in which they cut off the water, and this they had not done. The case having occupied some time, Mr. Hannay came to the conclusion that the rule as to the old fittings being sufficient, if perfect, did not apply in this case, and said that he must dismiss the complaint. It was in the nature of an arbitration, and there would be no order.—Mr. Wontner hoped that the public would know what to expect from the water companies.—Mr. Hannay thought it would be difficult for them to learn unless they waded through half-a-dozen Acts of Parliament and the companies' private Acts.

A SEWAGE CONTRACT.

VICE-CHANCELLOR MALINS, has had before him the case of *Hope* v. *Romford Local Board of Health*. It was a bill filed to restrain the defendants from removing or selling, or allowing to be removed or sold, any of the sewage sediment in Old Church Field, Romford, or from damming up or allowing to remain dammed up the flow of sewage through the sewer in a meadow belonging to the board and in some fields, and from allowing the sewer at certain places to remain disconnected. The bill also prayed for the specific performance of an indenture of May 16, 1870, made between the plaintiff and the board, and for an inquiry as to the sums of money realised by the sale of the sewage; and lastly, as to the damage, if any, sustained by the plaintiff. It appeared that the local board, in 1868, were restrained by the Master of the Rolls from allowing the sewage of the town of Romford to percolate into the river Rom. Accordingly, in 1868, the board, by advertisement in the local papers and elsewhere, offered to lease the sewage of the town for a certain term,

and asked for tenders. Mr. Hope made an offer to the board, which was accepted, and a lease, dated May 16, 1874, was drawn up, by the terms of which all the sewage of the town which could fall by gravitation into an outfall sewer to be erected was leased to the plaintiff for seven years. In the last year or two, as alleged, the defendants had not fulfilled the contract; but, on the other hand, had sold some of the sewage sediment. The following compromise was eventually agreed to—to refer the case to Sir J. Bazalgette, C.E., the engineer of the Metropolitan Board of Works, to report to the court, and say whether the works as they then existed were sufficient to deliver to the plaintiff all the sewage of the town of Romford, or such part thereof as should fall by gravitation into the outfall sewer, which on May 16, 1870, conducted the sewage into tanks constructed on the farm, in the lease of that date mentioned, and if not, whether anything and what ought to be done or left undone, to give him such benefit.

FANATICISM.

The following graphic account of some recent proceedings deserve notice as an instance of the extremes to which Anti-Vaccination fanatics will go.

'Four Gainsborough men were released from Lincoln prison, to which they had been committed for non-vaccination. They were received by a large body of sympathisers, who organised a procession with bands and banners. At a suitable place they were addressed by G. B. Skipworth, Esq. The Rev. William Hume Rothery, president of the National Anti-Compulsory Vaccination League, then burned the Vaccination Act, the Governor of the Castle looking on, amidst the acclamations of the crowd. The procession then wended its way to High Street, along which it proceeded to the railway station amid deafening cheers, ladies waving their handkerchiefs from the windows, etc. The most perfect order was preserved. It is estimated that upwards of twenty thousand people werepresent. The four released prisoners then proceeded by rail to Gainsborough, where they were received in like manner, and escorted in procession with flags and music to the market place where another copy of the Vaccination Act was burned in the presence of ten thousand people. In the evening large and enthusiastic public meetings were held both in Lincoln and Gainsborough. At this last, testimonial cups were presented to the four heroes of the occasion by their fellow-townspeople, in grateful recognition of the noble self-sacrificing devotion to principle, which redounds no less to their honour and that of their country than to the service of the cause of true freedom and suffering humanity. Each cup bears the following inscription:—"Presented to ——— ———, at a public meeting, for having suffered fourteen days' imprisonment for conscience sake.—Gainsborough, January 29, 1875." The friendly narrator then goes on to say: 'Such demonstrations as these bear unmistakable witness to the real feeling of the country in respect to compulsory vaccination, and would all who entertain this feeling but bestir themselves at once to express it in an equally emphatic manner, the repeal of the Acts might be compassed in this very session of Parliament.'

We look upon this recital, however, in quite a different spirit. We deplore the folly of these people, and are indeed glad to know that their opinions are not shared by the great mass of their countrymen.

CONTRACTS OF LOCAL BOARDS.

A CLERK, although concurring in the opinion that a contract for upwards of 50*l.* entered into by an urban sanitary authority, under sec. 174 of the Public Health Act, 1875, and sealed with their common seal, is a deed, and consequently requires a 10*s.* stamp, has thought it desirable to submit the point to the Board of Inland Revenue, at the same time drawing attention to the case of *Brown* v. *Vawser*, 4 East, 584. In reply, he has received the following communication:

'Inland Revenue, Somerset House, London,
November, 1875.

'SIR,—In reply to the inquiry contained in your letter, I am directed by the Board of Inland Revenue to acquaint you that "a contract for upwards of 50*l.* entered into by an urban authority under section 174 of the Public Health Act, 1875," would require a ten shilling stamp.

'I am, sir, your obedient servant,
'FRED. B. GARNETT, Secretary.'

CHARTERS OF INCORPORATION.

SIR,—Can you give me any information as to the probable cost of obtaining a charter for a small town, say of 6,000 inhabitants; also if you know of any work that gives the necessary details as to mode of procedure? An early reply will oblige. J. D.

[The size of the proposed borough would not very materially affect the cost of obtaining a charter. We believe that this would not be less than 300*l.* or 400*l.* The outlay would come out of the rates if the charter sought were obtained. Mr. Gaches's book on 'Municipal Law' might assist our correspondent.]

SERVICE OF NOTICES.

SIR,—Would you oblige me in your next issue with your opinion on the following: Is it the duty of the borough surveyor or of the inspector of nuisances to sign and serve notices for the spouting of houses under the Towns Improvement Clauses Act, 1847, and if summonses are taken out, by whom should the information be laid?

Kidderminster, Oct. 22, 1875. SUBSCRIBER.

[On the whole, we think the above matter concerns the surveyor rather than the inspector of nuisances, as being a matter appertaining more immediately to buildings and works of construction.]

RURAL DRAINS.

SIR,—Will you in your next publication kindly answer the following query? A main drain has been laid in a village by the parish authorities. Various water-closets and house-drains are connected with this. Main-drain stink-traps have been fixed by the above authorities, but are not efficient. Are the rural sanitary authorities liable for the proper trapping of drains, or the highway authorities? The drains are under the supervision of the district surveyor.

H. CLEMENTS,
Inspector of Nuisances.

[Our correspondent's query is not very clearly expressed; but, if we rightly comprehend his statement of facts, the sanitary authority, and not the highway authority, is responsible for the condition of the drain and its fittings; that is to say, it falls to the sanitary authority to exercise supervision over the drain, and to see that no nuisance injurious to health arises.]

MEDICAL OFFICERS OF HEALTH.

SIR,—Will you kindly let me know your opinion and the law, if possible, on the following point? It is proposed by Mr. Andrew Doyle, the poor law inspector, to amalgamate the counties of Denbigh and Flint into one sanitary district, and to appoint a medical officer of health over the whole, at a salary of 800*l.* a year, the appointment to be made by a number of members of boards of guardians, town councils, commissioners, local boards, etc., who hold office in the two counties; the said officer to reside in the counties, and to be the only one responsible for sanitary matters. Now, I wish to know whether such officer, according to the intention of the Local Government Board, would have any jurisdiction in such places as this, when

the improvement commissioners appoint, provide, and maintain a medical officer of their own? In the event of such appointment, would the present officers to boroughs, improvement districts, etc., be done away with or not? And if they are to be done away with, what compensation are they to receive in lieu of their salaries?

A. EYTON LLOYD.

[Mr. Doyle's suggestion is to the effect that several medical officers for detached districts should be superseded by one officer for a united district, and a very good suggestion it is. Any existing officer superseded by the operation of such an arrangement will, of course, be entitled to, and will receive, compensation. In districts which do not take part in a joint appointment, the new officer will have no jurisdiction, unless section 286 of the Public Health Act be put into full force.]

Correspondence.

VITAL STATISTICS.

(*To the Editor of the* SANITARY RECORD.)

SIR,—The question raised in your article on Dr. Child's report as to the value of sanitary statistics is a very interesting and important one. I have long felt that the Registrar's Returns of the causes of death are very unsatisfactory, and that the materials of which they consist are so variable in accuracy as to make it very difficult to construct from them tables of scientific value.

I think, however, that Dr. Child overstates the case when he says that 'Sanitary statistics, as we are at present able to obtain them, are utterly useless for every scientific purpose, and, indeed, not only useless, but mischievous and misleading.' It is certainly an extremely wearisome and irritating task to compile these statistics, and one not calculated to increase one's respect for the members of our own profession who supply the raw material. It is, indeed, impossible to acquit the writers of many certificates of the cause of death, of crass ignorance, and sometimes even of a desire to conceal facts; but fortunately there is always some category under which the death may be classified, which gives the record of it a scientific value of some kind, though perhaps the certifier may have done his best, or worst, to make it quite valueless.

It would be easy to multiply instances of absurd and obviously erroneous returns of the cause of death. I have seen 'Dropsy,' 'Hæmorrhage,' 'Cellulitis,' 'Worm Fever,' 'Inflammation of the Chest,' 'Jaundice,' and 'Ascites' returned as causes of death. I have seen a child fifteen days old returned as having died of 'Jaundice and Asthma!' There is, indeed, a grim sort of entertainment to be got out of this sort of literature (!), which is made grimmer still by the reflection that if the treatment was as vague as the diagnosis, the 'debt of nature' was perhaps paid before it was due.

The inclusion of all deaths from diarrhœa under the category of zymotic disease is doubtless a monstrous piece of folly. The vast majority of these cases are mere diarrhœa of dentition, or the result of bad feeding, or of local abdominal disease, and no more 'zymotic' than is a broken leg. I constantly decline to classify them as zymotic, and, indeed, I am not at all sure that any form of diarrhœa, except Asiatic cholera, is 'zymotic.' Croup, again, is classed as 'zymotic' by the Registrar-General, but there are many competent persons who think that the Registrar-General's pathology is, to say the least, debateable.

But when we have eliminated the 'absurd,' the ingeniously misleading,' and the 'misleading certificates which are not ingenious, there still remains a mass of evidence which I cannot admit to be either useless, mischievous, or misleading. Independently of the medical part of the certificate of the cause of death, there are in every such document three highly important statements, viz., 1. The age; 2. The sex; and 3. The residence of the deceased person. Students of vital statistics who do not expect data to support conclusions beyond their possible scope and relevancy, will be quite contented to use these data for their legitimate purpose, and will be thankful to get them. They are good data as far as they go, and any conclusions logically drawn from them are as 'scientific as any other conclusions from any other data.

Let us, however, look at the more medical aspect of the returns. Are conclusions based even upon imperfect or inaccurate data necessarily unscientific? I think not. It depends much upon the nature of the conclusion sought to be established. There are, moreover, possible limits to the degrees of inaccuracy as well as to the kinds of inaccuracy in returns of the cause of death; and even if an induction be incomplete, it may be complete enough to show in which direction the search must be continued. Negative results, too, are sometimes as valuable as positives.

It appears to me that defective as the ordinary registrar's returns are, the data they supply are amply sufficient for many conclusions material to the main problems of sanitary administration, as well as for the construction of some sound theories in vital statistics. That they are useless for many conceivable inquiries, the successful prosecution of which would be highly advantageous to more than one branch of biological science, no one can deny; but that they are mischievous, useless, or misleading, is a sweeping proposition which I must decline to assent to. Whether under some circumstances, and in some hands, the mortality returns may not be useless, or misleading, or even mischievous, is another question. People who are crotchetty or incompetent may make wild work with vital as well as with economic statistics, but that is the fault of those who are crotchetty and incompetent, and not of the statistics with which they are 'meddling and muddling.' Those who are anxious to find out impossible relations between facts, must e'en be content to find their facts useless; it was not the fault either of the sun or of the cucumbers that the philosophers of Laputa did not get sunbeams out of the latter.

It is satisfactory to read of another protest against the present state of the law as to notice of cases of dangerous infectious disease. A strong and united remonstrance from officers of health should go to the Local Government Board against this fatal defect of any legal obligation to give timely notice of all cases of dangerous infectious disease. It is in vain now that we toil after epidemics without the remotest chance of overtaking them. The onus of giving information should rest upon the householder in whose house the case occurs. There is no reason why the burden should be shifted on to professional shoulders already overburdened with artificial responsibilities. But if the *vis inertiæ* of the British householder is too great to be overcome, then let the medical attendant be compelled to give the information and be adequately paid for doing as a deputy that which ought to be cheerfully done in his own behalf by every good citizen.

There is one other point in Dr. Child's report which should not pass without remark. I refer to his denunciations of sanitary authorities. If Dr. Child would remember that the opinions of the multitude are only the cast-off opinions of the philosophers of a previous age, he would be less impatient, perhaps, of the lagging zeal and mental obtuseness of some sanitary authorities. It is hopeless and perfectly useless to expect local authorities to see eye to eye with us all at once, and certainly impolitic to hector them. The platform upon which sanitary experts stand is so far above that of the average laymen who carry on the work of local self-government, that the latter must not be expected to mount to it at a bound. It is enough if they show a disposition to learn, and their education will certainly not be hastened by fierce invectives. There is nobody so hard to drive as an average Englishman, and if we are to do any good we must, by all means, avoid provoking a spirit of

opposition and hostility towards us, as medical officers of health, on the part of the local depositaries of power. I am not for mealy-mouthedness or scattering ambiguous voices, but is it likely that a habit of rating and disparaging the authorities under which we work will engender goodwill, foster confidence, or promote any good end?

In conclusion I venture to think we need not fear a 'Jacquerie' in this country. The middle classes are on the side of order in England. They were on the side of the 'immortal principles' (viz. murder and rapine) across the Channel in 1789. This makes all the difference.

HENRY H. VERNON, M.D.

Southport, Nov. 15, 1875.

THE FACING OF TEA.

(*To the Editor of the* SANITARY RECORD.)

SIR,—All that Mr. Wanklyn can say in defence of the facing of tea is that it enables the lady of the house to distinguish more easily the green from the black as they lie in the tea-caddy. But it is surely hard that others should be compelled to drink faced-tea for so small an advantage. He has not, however, touched upon the point that such tea is prepared solely for the foreign market, whilst no native of a tea-producing country ever uses it. With regard to the dyeing of cloth, while admitting some of the objections mentioned, I may point out that it is possible to avoid injurious or poisonous dyes. We know also that dark clothing is warmer than light, which in our climate is an utility. That it is unadvisable to encourage concealment of dirt is most true, but it is not necessary on that account that we should have clothing that would show the least speck. The eye must be satisfied as well as the other organs of sense, and I doubt, therefore, if we should like to see ourselves or our neighbours perpetually dressed in undyed woollens.

F. DE CHAUMONT.

November 13, 1875.

SIR,—Mr. Wanklyn, in his noble defence of the time-honoured practice of colouring teas for the British markets which appears in your columns, p. 362, makes use of the best possible arguments against dyeing and colouring.

It seems to me like begging the question to endeavour to prove a parallel between articles of food and of dress. Are we to allow the fancy and fashion for artistic display in articles of clothing, to have its swing amongst those which nourish our bodies? Are we to consider our teas as pretty teas, and give our ladies an excuse to 'go shopping' to the grocer's as well as to the silk mercer's? Is it not easy enough to distinguish a genuine, uncoloured, green Indian tea from any of the black ones? Why then dye it?

It is quite an exploded idea, gone with the sensational 'Death in the Pot,' that tea colouring, as now practised, is either injurious to health, or added to increase bulk, the labour of applying such small quantities of matter costs more than the value of the added weight at the price of tea. Reiterate Mr. Wanklyn's own terms, and using the word tea instead of 'fabric' apply them to the other side of the question, we then get at the very marrow of the bone of contention; I would say, with him, 'Dyeing does not strengthen a tea and make it last longer.' Dyeing conceals dirt, and sometimes makes an inferior tea seem a superior one. In other words, decayed, used-up, or mouldy leaves may, in bran new green jackets, and in an elegant caddy, be as pleasing to the eye of a lady as any of your most perfect young growths; and, as green teas, especially in the south of England, are used chiefly in small quantities, mixed with black teas, these fraudulent 'green backs' get through the pot without detection.

Let us hope that we may speedily quash the practice which John Chinaman has adopted of sending teas specially coloured with brilliant tints for the British consumer, just as we send out gorgeous bandannas for the niggers. May we, however, never see a British crowd in 'undyed cottons and woollens.'

ARTHUR ANGELL.

Hants County Laboratory.

Review.

Milk in Health and Disease. By A. HUTCHISON SMEE, M.R.C.S., F.C.S., F.G.S. London: Edward Newman, 1875.

THIS little book (consisting of twenty-two pages of letter-press, and an appendix comprising a letter reprinted from the *Times* newspaper, forty-four pages of tables, and a concluding page of remarks on those tables) is little more than a pamphlet.

Directing our attention to the tables (which, as just mentioned, constitutes the major portion of the book) we find that they consist of readings of the lactometer and creamometer applied to the milk of cows of different breeds; and on inspecting the lactometer readings (*i.e.*, specific gravities) we find them to be curiously low. On p. 27, for instance, the mean specific gravity of the different milks falls much nearer 1·020 than even 1·025. The real specific gravity of ordinary cow's milk being, as is well known, about 1·030, we were led to conjecture that an inaccurate lactometer had been employed in these observations. Mr. Smee, however, furnishes a different explanation of this anomaly, telling us, in the final page of remarks on the tables, that no care was taken to cool down the milk to normal temperature, preparatory to using the lactometer, and that when the specific gravity was taken, the temperature of the milks must have been that of blood-heat, and that a specific gravity of 1·022 in the tables must, therefore, be understood as corresponding to 1·030 at standard temperature. Such being the nature of these readings, it will be understood that the tables have neither scientific nor practical value of any kind.

In a dedicatory page Mr. Smee junior prefaces the book by giving the information that he is (or was) a pupil of Dr. Frankland's, and having done that, publishes a number of his analyses of different samples of milk. The analyses are no more to be trusted than the table of specific gravities which serves as padding. As a specimen we will quote the analysis at the top of page 4, showing 9·5 per cent. of total solids, 3·0 per cent. of fat, 3·1 per cent. of casein, and 0·7 per cent. of ash. This wonderful milk yielded, according to Mr. Smee, 10 to 12 per cent. of cream, and had a specific gravity of 1·031 (which by misprint is represented as 10·31 specific gravity). Mr. Smee adds that he is quite sure of the accuracy of this specific gravity, by which we presume he means to indicate that in this instance (unlike the instances in the tables) he really did take the precaution of bringing the milk to standard temperature.

Persons who are familiar with milk-analysis will perceive a crop of absurdities in Mr. Smee's account of this milk.

Thus this analysis affirms that the 'solids not fat' amount to only 6·5 per cent. instead of to 9·3 per cent.; that the milk-sugar is 2·7 per cent., whereas the milk-sugar in cows' milk is usually about 4·6 per cent.; and that an aqueous solution, consisting of 3·1 per cent. of caseine, 2·7 of milk-sugar, and 0·7 of ash, has a specific gravity of 1·034. This last is a physical impossibility, being about as incredible as, for instance, that a mixture of pure alcohol and pure water of specific gravity ·9528 at 60° Fahr. contains only 10 per cent. of alcohol.

We might weary our readers with exemplifications of the badness of these analyses: suffice it to say that they are utterly worthless, and that the book is discreditable to a gentleman who possesses the qualifications and has enjoyed the privilege of the teaching of which Mr. Smee boasts.

THE Society of Arts promises an excellent series of lectures for the winter session. Many subjects of importance to the health and well-being of the community will be exhaustively treated by gentlemen competent to deal with their subjects in a thoroughly practical manner.

Sanitary Invention.

BUTLER'S PATENT HIGH OR LOW PRESSURE BALL VALVES AND COCKS.

THE use of these adjuncts to water tanks and cisterns are well known to every one, but there are some old patterns still in the market, which are sold for cheapness sake, and which ought long since to have been discarded. Some few years ago, Mr. Gale, civil engineer to the Glasgow water works, examined about 600 taps, and found one which wasted 2,656 gallons a day, another 2,500, two 2,000 gallons a day, one 1,500, one 1,000, ten between 500 and 1,000, and fifteen between 300 and 500 gallons daily, being something over seven millions of gallons of water wasted daily from the Loch Katrine reservoirs. These ball cocks were, however, of the commonest kind, and, as proving what invention has done for us, it may be mentioned that when fifty-six of Lambert's ball-cocks were examined the total quantity of water which they wasted amounted to only 5,455 gallons for the whole number. But this water was in reality only wasted by defects in nine cocks, the rest being quite tight.

Every year adds to the number of these useful contrivances in the market, and it is a difficult matter sometimes to choose between one and the other of them, between patent equilibriums, diaphragms and the rest. In our journal of December 5, 1874, we noticed also a novelty in the matter of Finch's disc-shaped cistern valve and lever, and we now notice another novelty in the ball valve of Messrs. Butler and Askie, of Southwark. Unlike any other ball valve which we have ever seen, the pressure of the water assists in closing the valve, and is not against the ball rising. When the valve is open, its position is above the centre of the supply-pipe, thus permitting a free flow of water. Moreover, as the cistern fills, and the ball rises, the pressure of water assists the ball to rise, and the valve to close. Inside the ball is a small compensating weight to insure the valve always being open at the proper time, and as this valve is over the seating instead of under it, the pressure aids the working of the valve, and it is nearly impossible for it to get out of order. No cup leather requires to be used with this ball valve, and consequently there is no fear of the parts sticking as the leather fouls.

With nearly all patterns of ball-valves, however, it need not be said that a great deal of their efficiency will depend upon the plumber who fixes them. If he does not adjust the ball in such a way that the cock shuts off when the cistern is full, or if he attaches too small a ball, or worse than that if the ball is made imperfect and water gets in, the best workmanship of the shops will be rendered useless. It strikes us that the Butler's patent ball valve is a well-considered invention, and that the inventor has hit upon a sound means of remedying at least one of the faults of the commoner patterns. Householders have not now to be told that one half of the plumber's bills which they are obliged to pay is owing to the ball-cocks in their cisterns 'which have stuck again.'

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

BARNES, Mr. Richard, has been appointed Inspector of Nuisances and Collector for the Haslingden Urban Sanitary District.

BELSHAW, Mr. W. H., has been appointed Clerk and Collector to the Ramsbottom Urban Sanitary Authority, vice Gill, resigned.

BENNETT, John, Esq., has been appointed Chairman of the Goole Urban Sanitary Authority.

BICKLEY, Mr. William, has been appointed Inspector of Nuisances for the Royston Rural Sanitary District, vice Mills, resigned.

BOOTH, Lionel, M.D. Univ. St. And., M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Accrington Urban Sanitary District, vice Gillespie, deceased.

CAPE, Joseph Thomas, M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Totnes Rural Sanitary District, vice the District Medical Officers, until Christmas, 1876: 100*l.* per annum.

CHUBBS, Mr. T. T., has been appointed Inspector of Nuisances for the Whitchurch (Salop) Rural Sanitary District: 50*l.* per annum.

DENT, Mr. James, has been appointed Clerk to the Middlesborough Rural Sanitary Authority.

DUCKINGFIELD, Mr. J. H., has been appointed Surveyor to the Haslingden Urban Sanitary Authority.

DYKE, Mr. Robert, has been appointed Inspector of Nuisances for the Northampton Urban Sanitary District, vice Gardner, deceased.

ENGLAND, Mr. George, jun., has been appointed Clerk to the Goole Urban Sanitary Authority.

MORRELL, William Wilberforce, Esq., has been appointed Treasurer to the Goole Urban Sanitary Authority.

MOUNTFIELD, the Rev. D., has been appointed Chairman of the Newport (Mon.) Urban Sanitary Authority.

NUTTALL, Mr. Thomas, has been appointed Surveyor to the Ramsbottom Urban Sanitary Authority, vice Gill, resigned.

PLAYSTED, Mr. James, has been appointed Surveyor to the Blakeney Urban Sanitary Authority, vice Griffiths.

PERKS, Charles, L.R.C.P. Lond., M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Burton-on-Trent Urban Sanitary District, vice Belcher, resigned.

PHELPS, Mr. James, has been appointed Collector to the Blakeney Urban Sanitary Authority, vice Griffiths.

REDWOOD, Thomas Hall, M.D. Durh., L.R.C.P. Lond., M.R.C.S. Eng., has been reappointed Medical Officer of Health for the Rhymney Urban Sanitary District.

ROWLAND, Richard Henry, Esq., has been appointed Treasurer to the Haslingden Urban Sanitary Authority.

TUDOR, Mr. Edward Charles Buchanan, has been appointed Inspector of Nuisances for the Goole Urban Sanitary District for one month, pending further arrangements.

WATSON, Alfred Marchmont, M.D. Univ. Edin., M.R.C.S. Eng., has been appointed Certifying Factory Surgeon for Penistone, Yorkshire, vice Ward, deceased.

WATSON, Mr. Robert, has been appointed Surveyor and Inspector of Nuisances for the Keighley Urban Sanitary District, vice Alty, appointed to the Barrow-in-Furness Urban Sanitary District: 160*l.* per annum.

VACANCIES.

BETHNAL GREEN PARISH. Medical Officer of Health: 150*l.* per annum.

BLAYDON-ON-TYNE URBAN SANITARY DISTRICT. Inspector of Nuisances: 80*l.* per annum. Surveyor: 40*l.* per annum. Applications, 25th instant, to Henry Dalton, Clerk to the Authority.

GREAT HARWOOD URBAN SANITARY DISTRICT. Medical Officer of Health.

MIDDLESBOROUGH RURAL SANITARY DISTRICT. Inspector of Nuisances and Surveyor: 150*l.* per annum. Application, 23rd instant, to James Dent, Clerk to the Authority.

ST. LUKE, MIDDLESEX, PARISH OF. Surveyor: 250*l.* per annum Application, 23rd instant, to W. W. Hayne, Vestry Clerk, Vestry Hall, City Road.

SANITARY PATENTS.

2931. A new apparatus or apparatuses applicable to fireplaces to facilitate the lighting, burning and economising of fuel. Edward Tomlinson, Old Street, St. Luke's, London.

3585. Improvements in benzoline lamps. John Dyer, Sidmouth, Devonshire.

3595. An improved method of slaughtering, preparing, and packing fresh meat for exportation, importation, and sea-going purposes, and apparatus connected therewith. Kennard Knott, London, Middlesex, Ontario, Canada.

3606. Improvements in washing machines. William Bell, Glasgow, Lanarkshire, N.B.

3622. Improvements in the manufacture of fuel. William Robert Lake, Southampton Buildings, London.—A communication from Theodore H. McPherson, Washington, U.S,

3637. Improvements in street pavements, and in means or apparatus for laying the same. John Rowbottom, Halifax.

ABSTRACTS OF SPECIFICATIONS.

1053. Filters. H. Rawlings, Lambeth.

The nature of this invention is to provide a means of controlling the currents of liquids passing through any filtering medium and substance by mechanical arrangements and dispositions in the filtering vessels to attain this result, and to construct portable and table filters on an improved plan, that storage of filtered water may be unnecessary. Also to provide a ready means of regulating the flow of water through filters in the total quantity of liquid delivered, and for entirely stopping the flow if required.

1074. Mangles. G. W. Bacon, Strand.

This improved mangle consists of two wooden rollers provided with journals, which are turned in the usual manner. The said rollers are carried by suitable bearings in head-pieces or frames, the lower extremities of which are formed as clamps. The bearings for the lower roller are cast solid with the head-pieces or frames, the bearings for the upper roller being made separate and held in position by springs and by grooves turned in the journals of the roller, there being correspondence projections on the insides of the bearings.

1146. Collecting street mud. J. McCarthy, Camberwell.

Abolition of deposits of mud and other refuse in the street gutters and by the road sides. Expeditious and an improved method of cleansing the streets. Saving of manual labour.

1152. Medicinal discs. W. R. Barker, New Bond Street.

The novelty of the invention consists in mixing with gelatine or isinglass or their compounds in a state of solution certain curative component chemicals which subsequently become congealed, and may be divided into discs of different sizes according to the strength or property of the chemical and the complaint it is desired to cure. By this method all the strength of valuable preparations is preserved for any length of time, and the discs are easily dissolved when required either for use as injections or as medicines or medicaments.

1154. Farinaceous compounds. W. R. Barker, New Bond Street.

By this invention farinaceous and such like compounds are compressed into a small space by hydraulic pressure or other suitable means for the purpose of reducing their bulk and thus facilitating transit. Foods thus compressed will also be found to contain their purity in a far higher degree than the ordinary uncompressed farinaceous compounds.

1165. Purifying illuminating coal gas. S. Hallsworth, Armley, and R. Bailes, Woodhouse Carr.

First, residue of burnt iron pyrites when ground is mixed with slacked lime and liquid from iron pyrites at copperas works. Secondly, sediment from pans at copperas works mixed with slacked lime and liquor from pyrite beds and sawdust. Refuse lime used in the distillation of ammonia may be substituted for slaked lime. Thirdly, dried refuse lime with spent iron pyrites and sawdust. Mixtures are used in varying proportions.

1170. Alimentary substances. J. G. Tongue, Southampton Buildings.

This invention relates to a new process or means of preparing alimentary substances by combining the nutritive elements contained in rice, semolina of wheat or Indian corn, gluten and vegetables, with the azotic principles of soluble meat. In carrying out this invention, rice, semolina of wheat or Indian corn, buck wheat, and gluten, is steeped or mixed with broth of meat. Also in preparing with boiled vegetables a kind of vegetable tapioca. Further in mixing in concentrated broth (pot au feu), the vegetable tapioca alone or mixed with other products. All these products are either granulated or in cakes according to the wants required.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer—not necessarily for publication.

Mr. G. C. Searle, Broxham.—We shall be glad to receive copies of reports, especially where they relate to anything of more than purely local interest.

PROSAIC AUTHORITIES.

THE Improvement Commissioners of Leek have refused to receive into their cemetery the following inscription on the tombstone of a Mrs. Newall:—'Twenty-one years a dutiful daughter, three years a chaste and virtuous sweetheart, and forty years a loving wife.'

SANITATION IN MELBOURNE.

A SOCIETY has just been formed in Melbourne called the 'Australian Health Society,' the objects of which are: '(1) To create an educated public opinion with regard to sanitary matters in general by aid of the platform, the press, and other suitable measures; (2) to induce and assist people by personal influence, example, and encouragement to live in accordance with recognised laws whereby health is maintained and disease prevented; and (3) to seek the removal of all noxious influences deleterious to the public health, and to influence and facilitate legislation in that direction.'

VENTILATION OF RAILWAY CARRIAGES.

THE Winchell car ventilator, which has been recently tested on a car of the Cincinnati, Hamilton and Indianopolis road, is thus described by the Indianopolis *Journal*: The apparatus consists of an air-chamber attached to the roof, and extending the entire length of the car. Each end is supplied with a hood protected by very fine wire gauze screens, through which the air, and nothing else, is admitted to the chamber. Each drum is furnished with a cut-off, operated by a lever within the car, by means of which the supply of air may be regulated to a nicety. A number of registers in bottom of the chamber admit the air to the car. When the train is in motion, the cut-off in the forward end of the car is opened, and the air enters, passes down through the registers into the car, and, having served its purpose, makes its exit through the rear hood, or, if the windows are open, through them. In connection with this air-chamber, and for summer use only, are deflectors on the outside of each window, which, acting as an exhaust, not only draw out the impure air from the car, but prevent the admission of smoke, dust, cinders and rain through the open windows. These deflectors, being made of glass, do not in the least impede the view from the windows. They are operated all at once, by means of an iron rod running along the side of the car.

POISONED TOY BALLOONS.

IN a report of the sanitary inspector of Glasgow it was stated that he had had his attention called to the poisonous nature of the colouring matter applied to the 'India-rubber toy-balloons' sold to children in great quantities in that city. He procured two samples, one coloured blue and the other yellow, and put them into the hands of Mr. Tatlock, one of the city analysts, who had given certificates with observations. As to the blue balloon, Mr. Tatlock said that as 'ultramarine blue is chiefly composed of silica, alumina, soda, and sulphur—harmless ingredients—the practice of using it for such a purpose as filling these balloons could not be regarded as dangerous.' In the case of the yellow colouring material, however, Mr. Tatlock arrived at a different opinion. The matter was composed of one part chromate of lead (chrome orange) and three parts of carbonate of lime (whiting), and on these he reported as follows: 'As chromate of lead is strongly poisonous, both on account of the chromic acid and of the lead which it contains, the practice of using it for such a purpose as this is highly reprehensible. Children are in the habit of applying their mouths to the orifice of these balloons for the purpose of filling them with air, and in this way may readily receive a quantity of such poisonous powder into their mouths.'

DISINFECTANTS AND DISINFECTION.

AN interesting paper by E. Waller, Ph.D., in the *American Chemist* for July, sums up admirably what is at present definitely known on this important subject. The following are the conclusions drawn by the writer:

(1) For prompt disinfection which is to be only temporary, strong oxidising agents, as chlorine, permanganate of potassium, nitric acid, etc., should be used. Of these the cheapest and most available is the chloride of lime.

(2) Carbolic acid may be diluted to a point at which it ceases to act as a disinfectant, though it may still act as an antiseptic. To disinfect, the carbolic acid should probably constitute about one per cent. of the mixture.

(3) The action of metallic solutions in disinfecting is comparatively slow. Ferric nitrate especially, and iron and zinc salts generally, are the best of this class of disinfectants.

(4) A mixture of iron and zinc salts seems to be superior to either used alone.

(5) The preparations known as carbolates of lime usually contain but little carbolic acid, and are of comparatively little efficacy. The lime absorbs carbonic acid from the air, and the efficiency of these preparations as disinfectants is apparently diminished in proportion as the lime assumes the form of carbonate.

(6) The powders (carbolated) containing no lime have still less effect on putrid matter than those in which lime is an essential constituent.

PIG-KEEPING.

(*To the Editor of the* SANITARY RECORD.)

SIR,—Your correspondent, the Inspector of Nuisances for Reigate, would find at Blackpool to his cost that he is mistaken in his assertion that any by-law or rule of any sanitary authority forbidding the right of keeping pigs is bad in law and cannot be enforced. The appended by-law has caused the exodus of pigs from Blackpool, for as you correctly observe, October 23, 'A watering place that has not yet banished its pigs must, indeed, be in a state of sanitary progress which is more primitive than hopeful.'

P. HINCKES BIRD, F.R.C.S., S.Sc. Cert. Camb.,
Lytham, November 8. M.O.H. Blackpool.

'*By-Law made by the Urban Sanitary Authority of the District of Blackpool, in the County of Lancaster, as to the Keeping of Pigs within the said district.*

'No occupier of any premises within the district shall keep any pig within twenty yards of any occupied dwelling-house.'

'Any person offending against the above by-law shall forfeit and pay for every such offence a penalty of Five Pounds, and in case of a continuing offence a further penalty of Forty Shillings for each day after written notice of the offence from the said urban sanitary authority, or their authorised officer.'

'Provided, nevertheless, that the justices or court before whom any complaint shall be made for a breach of the foregoing by-law may, if they see fit, reduce the amount of the penalty herein prescribed as they may deem advisable.'

At a meeting of the urban sanitary authority for the district of Blackpool, in the county of Lancaster, holden this fourteenth day of April, one thousand eight hundred and seventy-four, it was resolved that the above by-law be passed and allowed.

HENRY WORTHINGTON, HENRY HALL, jun., THOMAS HOYLE, JOHN WADE, ALEXANDER MOORE } Five of the members of the urban sanitary authority for the district of Blackpool.

WILLIAM M. CHARNLEY, Clerk to the said Authority.

Allowed by the Local Government Board this seventeenth day of July, 1874. J. SCLATER-BOOTH, President.
JOHN LAMBERT, Secretary.

EARTH TO EARTH.—The superiority of the London Necropolis (Woking Cemetery) has been specially recognised in the *Times*, and other leading journals, and it is admitted that here only can the burial of the dead be properly carried out. The Company is prepared to conduct Funerals without the intervention of the ordinary undertaker at any stage of the proceedings. Prospectus free.—Office, 2 Lancaster Place, Strand, W.C.

NOTICE.

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Original Papers.

ON THE COMPARATIVE MERITS OF THE WATER-CARRIAGE AND DRY SYSTEMS OF SEWAGE DISPOSAL FROM A SANITARY AND ECONOMICAL POINT OF VIEW.

BY G. A. KENYON, M.B.

IN this paper I set forth the conclusions that I have arrived at, after a careful and impartial investigation into the respective advantages and disadvantages attending or likely to attend the general introduction of water-closets, as compared with dry methods of excrement removal, as a means for improving the sanitary condition of towns which have hitherto been dependent on the old-fashioned midden system.

There is, first, a point to be settled as to the frequency of removal which is to be considered necessary. Is removal to be effected within a week, or will it suffice if it be effected within three months?

Because a dry method of excrement disposal may be arranged on the basis of a removal once in three months, which will be a great improvement on the old midden system, and yet will involve but little expense in the way of structural alterations, and no very serious increase in the cost of cartage. So that if this arrangement can be sanctioned it will have such obvious advantages as to render any comparison with other systems unnecessary. The midden cesspools would be fitted up to the ground level, rain would be excluded, ashes would be easily and effectively distributed, the necessity for a drain would be avoided, inasmuch as, being above ground, there would be no soakage from the subsoil, and any temporary excess of moisture could escape along a surface-channel to the yard grid.

The cost of this alteration will about equal that of putting in a water-closet apparatus. And the after-expense of removal would be little more than that which would in either case be necessary for removing the ashes and house-refuse, say 10s. a year. And the expense attending the inspection and repairing of the water-closet, and the water itself, would be a clear saving.

The opinion of very high authorities is, however, dead against any such infrequent removal in the case of towns, although for country villages it is sanctioned. And chiefly because of the likelihood of mischief arising from the retention of infected discharges, and from that general depreciation of the purity of the atmosphere of the place which must be occasioned by what becomes in the aggregate an enormous accumulation of filth.

Hence we find ourselves called upon to decide between water-closets and a dry method which will provide for removal not less frequently than once a week, and the dry methods which enable us to do this are almost without exception tub or pail systems.

One of the most serious objections urged against the general adoption of water-closets is that their construction is so delicate as to be entirely unsuited to the rough usage they must meet with amongst the lower classes of the population, that they will be always getting stopped up or broken.

I felt the force of this objection, and I felt, of course, that an answer confirmatory or otherwise would be found in the experience of those towns in which water-closets are in universal use. One of the best instances is that of Coventry (population 38,000), where the change from midden privies to water-closets has been made within the last ten or fifteen years. It has been conducted gradually and unostentatiously, without any special assistance, by the inspector of nuisances and the surveyor working together, with occasional medical assistance; and I was informed by the inspector of nuisances that some little difficulty of the kind referred to was encountered, especially at first, but it was by no means serious, and he had never had occasion to regret the alteration. The medical officer of health, Dr. Fenton, confirms this satisfactory opinion.

In Warwick (population 11,000), Dr. Wilson, the medical officer of health, reports most favourably of the workings of water-closets, the use of which is universal.

In Bristol (182,000), eight men appear to be constantly employed in keeping the closets in order. This is not a large number considering the population, and considering that in this district the closets are flushed by hand. In Dr. Netten Radcliffe's report it is stated that this system works very well under these circumstances.

Another serious objection urged against the use of water-closets is that their general use is attended with an increased prevalence of typhoid fever, and evidence is quoted, from Edinburgh especially, showing that typhoid is more prevalent in the New Town with water-closets than in the Old without. But on investigation it will be found that this objection tells not against water-closets, but against having them inside houses; the difference in temperature between the inside of a house and the outer air will give the house, as it were, a suction power which will often lead to the introduction of sewer-gases by the soil-pipe when a water-closet is inside a house. But when the water-closet is outside the house, or separated by a space with cross ventilation by opposite windows, this danger is entirely avoided.

Besides escaping these objections, the pail systems are supposed to be available in districts where water-closets are unadvisable on account of the difficulty in dealing with the sewage at the outfall from the sewers, or where water is scarce, or because it is thought that a profit may be obtained, *i.e.*, that some of the materials may be utilised as manure under the pail system, when otherwise they would be wasted.

Thus arises the question, how much does a pail system do to relieve the sewers? This it seems to me is the chief point on which the subject turns, because every town is sewered, and if there is no difference in the constitution of the sewers required for the employment of water-closets, the matter is very much simplified.

The result of my inquiries is to show that, as regards the sewers themselves, sewers that are of suitable dimensions for the other requirements of a town are equally suitable for the use of water-closets, for the actual solids introduced by the water-closets are as to bulk quite insignificant, and there is only the water employed for flushing to be accounted for. In Bristol the slops are used for this purpose, which, with the rainfall, appear to be amply sufficient, only, as they are generally applied by hand, more frequent inspection is required. With reference to this point I may mention that in a

village near Chester a similar custom is met with. In Bristol these water-closets are called privies; but in this village they are really privies, but instead of being emptied in the usual manner are flushed by hand into the sewer from time to time; thus a poor woman complained that the connection of the drain from her closet had been somehow cut off from the sewer, and she did not know what to do about emptying the closet. In another case, where the sewer was at some distance, a man had dug a hole in his garden and connected it by a pipe with his privy; he showed me a tubful of rain-water, with which he was accustomed to flush the contents of the privy into the hole in the garden.

But in towns where the ordinary system is employed, the amount of water required for flushing water-closets is, compared with that demanded by the other requirements of the town, much less than might be supposed, and from calculations made by the water-engineer in the case of Liverpool, appears to be about one-seventh additional.

And this saving of water, which will rarely be a matter of great importance, seems to me the only advantage that the pail system can claim over the water-closet system, for the difference in the bulk of the sewage at the outfall caused by the extra quantity of water will be much less than the difference in the water-supply just considered, and the difference in the amount of purification required is virtually nothing. It is the urine and the slop-water, and the washings from the streets that chiefly require the employment of means of purification at the outfall. Neither is it the excrement that obstructs sewers and drains, but ashes and detritus from the roads.

But as the pail systems have little or no advantage over the water-closets in their best points, what about their disadvantages? And first as to the mechanism for collection and removal; the expense of this must be very great, and to avoid waste of power, by too frequent collection or nuisance from delay, the organisation requires to be very perfect.

In Manchester 10,000 closets required twenty-eight to thirty vans, each of which with one horse and two men may be taken as costing almost 5*l.* per week each.

Again, there is a good deal of stink from the pail after the first day, so that, in Manchester, flues or chimneys are provided to remove it in each closet, and this notwithstanding the use of ashes. Again, there is practically no certainty that disinfection will be obtained or can be dispensed with. In the water-closet the complete and immediate removal of infectious discharges is of great advantage.

As to the value of the contents of the pails, until lately there was nothing satisfactory known. But I find in Manchester this part of the question has become unexpectedly cheerful. Last November I was informed that orders were in hand for 2,000 tons at 10*s.* per ton. And it was anticipated that a large profit would be made out of the business.

Should these anticipations be fulfilled, the difference in expense between the use of pail-closets and water-closets will perhaps have to be left out of consideration. But the value of the proceeds will, I fear, seldom be a source of profit, because the expense of the large staff of men, horses, vans, etc., may swallow up even 10*s.* per ton.

The conclusion I have come to, therefore, is that as between water-closets and pail systems for town districts, the water-closets offer great and unmistakable advantages, inasmuch as they fulfil sanitary requirements more perfectly than pail systems, at less expense, and with much less annoyance.

It is important to note, in view of the difficulty generally experienced in introducing improved closets, arising from the poverty of many owners of property, that, according to Dr. Radcliffe, in Liverpool the town-council have made grants in aid to the extent of 40,000*l.* since 1866. It is only since commencing to write this paper that Dr. Netten Radcliffe's report to the Local Government Board * has reached me; it contains much of the information, which I had myself collected, from the original sources, and of course some additional matter.

FILTERS—GOOD, BAD, AND INDIFFERENT.

BY H. C. BARTLETT Ph.D., F.C.S.

THE presence of such vile contamination of various kinds in drinking-water as is frequently shown in the records of the scientific and daily journals, renders the question of reliable filtration one of paramount importance at this period of the year. The accumulated experiences of the bad character of the water supplied by public pumps, wells, and other sources, demonstrate the fatal facility with which admirers of sparkling clearness and grateful coolness may encourage any latent disposition to disease by constantly lowering the normal vitality of health in the pleasant but poisonous and delusive draught.

These experiences deserve to be again and again reiterated, to enable us to observe how very seldom even the most unmistakable indications of dangerous contamination in water are brought home to the comprehension of the unscientific partakers. Water drinkers, whether total abstainers or not, are seldom less dogmatic than other persons believing in their own crotchets; indeed, the perversity with which some persons permit their faith to abide in the imaginary virtues of several graveyard springs, notwithstanding every warning, is one of the most awkward, but not the less obstinate, phases of ignorance on the subject.

The important details of water analysis, it would be expected, might come before the sanitary authorities in so cogent a form, that the public supply of spring-water should be of ascertained purity. How little dependence can be placed in the spontaneous efforts of our vestries and other local bodies to attain this result may be gathered from recent disclosures.

If the public wells have been so frequently neglected, to what extent have the private sources of water-supply been left to the concurrence of accident to point out at the last moment, and, usually but too late, after the mischief has been done, that pollution is not only dangerous but deadly? Were we to multiply the instances of water-poisoning, proved by the effects produced, by the number of cases in which analysis has shown contamination before evidence of the injury they occasion has been forthcoming, we should but enumerate a very small proportion in relation to the wells and springs which have caused serious injury to health, without the slightest suspi-

* 'On the Means of Preventing Excrement Nuisances in Towns and Villages.'

cion having attached. In addition to these, and tending to further complicate the risks of impurity, there are many sources of public and private water-supply which are only intermittently objectionable.

Wells which yield the purest water during nine months of the year have been found, time after time, to dissolve and hold in suspension the most insidious of the contaminations with which we have to deal. The softer the water, the more freely will it dissolve albuminoid matters presented to its action by the surface of the watershed. The purer the water, that is to say, the less the proportion of certain mineral ingredients it contains, the greater its power of corroding and taking up lead and other noxious metals. Not only so, but the greater the difficulty of removing such matters by simple filtration.

The presence of large quantities of albuminoid matter in the autumn is always to be anticipated, particularly when we have a moist season, accompanied with heavy rains, and floods to wash such substances into the water sources. To such an extent does this exist, that we cannot blame the wealthy water companies for an almost unavoidable increment of impurity at these seasons. Accordingly, we find, during certain months of the year, the reports of the Government inspectors stating that all the waters have been turbid, containing fungoid growths and living organisms.* In fact, it is hardly to be expected that the best system of filtration applicable to such vast bodies of water as flow into the reservoirs can ever be perfect, or always all that can be desired. We have, however, a great security in the filtration to which the water is subjected at the intakes of the reservoirs, and the first necessity is that the vast filtering beds in use should be of the most efficient description, and that they should be of ample dimensions to pass through them any possible influx of flood-water.

No matter how excellent the filtration adopted at the intake of the water companies' supply, it affords no guarantee against infiltration of sewage or other poisonous matters along the many miles of buried mains. It is true that a continuous supply at full pressure would prevent the possibility of this, but without a sufficient pressure is always sustained within the mains and service-pipes, infiltration from the surrounding soil of whatever liquid abominations it may hold, as in a sponge, is not a liability only but an almost certain sequence.

The only real security, therefore, consists in the determination to use no water in the household unless it has passed through a domestic filter of approved action and construction, and above all that the chemical and mechanical action of the filter is maintained unimpaired.

Even when filtration has been duly carried out at the reservoirs, and no infiltration from the soil embedding the mains has taken place, there are other sources of contamination in the too commonly objectionable situations of the cisterns, and the possibility of poisonous impregnation from the matter carried by sewer-gases and the finer particles of street dust which are frequently composed chiefly of pulverised ordure. In removing these filthy and not always suspected deposits of the cisterns, we find the true use of the domestic filter in its least exigent form.

A heavier duty falls upon the house-filter during the periodic failures of the filtration at the reservoirs and the water supplied by some companies is never actually fit for drinking without a second effective chemical and mechanical filtration.

Such being the essential requirements after all the care and expense incurred in the supply of the best water the companies can afford to bring home to us, it is manifest that nothing less than the greatest possible precaution must be taken in the filtration of the water derived from private wells.

The finest drinking waters, of almost absolute purity as to organic matter, welling up from the deep chalk springs, are not unfrequently contaminated with surface water breaking through the borings at some short distance down the well. Analysis will, it is true, give the condition of the water with unfailing accuracy, but more than one analysis is needed to arrive at any assurance of the continuance of purity in water from even the most desirable sources. After several analyses, at different periods of the year, some waters may be held to be practically free from contamination, but these waters, except in certain chalk formations, are of very rare occurrence. Throughout the whole of the districts surrounding London where the soil is of a porous nature, in many other parts of England, and especially where mineral products are found close to the surface, spring waters may be generally suspected of being unfit for drinking purposes, unless subjected to the most careful and successful treatment. I am anxious to make it understood that the many kinds of filters which are now before the public are not without their separate and individual uses. Every one of them should at least be equal to the mechanical separation of suspended matters. In this alone they accomplish a very necessary object, but to render them suitable for the removal of the various kinds of objectionable constituents, each must be specially adapted to the peculiar water, for the purification of which it is to be used. A filter which will oxidise organic matters, will not, as a matter of course, remove poisonous metals from their solution, and the best method of removing such metallic poisons does not necessarily remove several other products which conduce to bad smells and nauseous flavours. Several mechanical contrivances materially assist the filtration of waters containing saline matters; but, on the other hand, softer waters require to be filtered through a differently constituted depurating medium. So many peculiarities in water have to be taken into account, that it must be quite apparent that we have no right to expect to be able to treat each unless by appropriate means. The conditions which render one filter suitable to a particular water form the very reasons why it would be unsuitable for water of a different type. If persons would take the precaution to ascertain the especial character of their water by analysis, and filter-makers were to bear constantly in mind that they have objects of very different natures to deal with, better results would be attained. Less disappointment would follow the sale of filters altogether unsuitable for the waters of their purchasers, which, in very many instances, happens from a want of knowledge on the part of both buyer and seller. In my next paper I shall have to pass under review some of the minute distinctions which characterise the various waters requiring filtration, and also the adaptability of different systems of filtration towards accomplishing this very desirable end.

* Vide Dr. Frankland's report, *Times*, November 9, 1875.

DEAN FOREST.

BY FRANCIS GEORGE HEATH.

THE public will have been sorry to learn, on the authority of Mr. W. H. Smith, the Financial Secretary to the Treasury, that he intends, subject to the consent of the Cabinet, to whom the matter has not yet been referred, to reintroduce the Dean Forest Bill of last session, with only a slight modification, next session. I have not before referred at length in these columns to the Dean Forest question because the Government bill already alluded to was withdrawn before it reached its second reading, and it was not expected that it would be brought in again in its original shape or without considerable alteration. From the statement, however, which has been made by Mr. W. H. Smith in a letter to Colonel Kingscote, the Liberal member for West Gloucestershire, it seems pretty clear that the bill to be introduced next session will be substantially the same as the dropped bill.

The necessity for legislation has arisen in the following way. The mining population of Dean Forest are housed in several irregularly built villages, the largest of which is Cinderford. There are no proper streets nor is there any good road accommodation between the villages. The drainage is bad, the water-supply is irregular, and the general sanitary condition of the villages is not what it ought to be. This state of things has arisen as the result of the haphazard way in which an increasing mining population has found house accommodation. New houses could only be built by encroachments on the waste of the forest, and about forty years since the encroachments made in this way amounted to as much as 2,000 acres of the waste. The encroachments were then by an Act of Parliament—based on the recommendations of a Commission of Inquiry previously appointed—legalised, the occupiers of the illegally-enclosed land being confirmed in possession, some—those holding the most recent enclosures—being required to make a small payment in return for their titles, whilst the occupiers of the older enclosures had their titles for nothing. In addition to the 2,000 acres already mentioned, there are about 2,800 more enclosed and in private occupancy out of the total area of Dean Forest; and it is in this part of the forest that the mining population live. A further extent of ground occupying about 1,000 acres is covered with rail and tramways, mines, quarries, and other works connected with the mining operations of the district.

The total area of Dean Forest was, in the year 1831, ascertained to be 24,000 acres, and the nominal area of the forest is still about the same. Of the total area 11,000 acres are set apart, under an Act passed in the reign of Charles the Second, for the growth of timber for the navy; and the land thus set apart the Crown is empowered to keep enclosed. Over the whole area of the forest, however, excepting the 4,800 acres already referred to, the ownership of the soil is vested in the Crown, subject, however—in the same way as forest land, the ownership of which is similarly vested in lords of manors, is subject—to rights of common. These rights of common, it must be remarked in passing, are of two kinds, namely, rights both over and under the soil, the nature of which will be presently explained. The right of the Crown to keep 11,000 acres of Dean Forest under enclosure, bars, as a matter of course, all rights of common. But there is this peculiarity in the arrangement under which the Crown can keep 11,000 acres continually enclosed. If at any time it be thought necessary, a portion of this quantity can be thrown out of enclosure, and another portion equal in extent can be taken into enclosure.

Of the 24,000 acres of Dean Forest, 18,500 acres are forest land, abundantly wooded; and of this quantity all except the 11,000 acres enclosed by the Crown is open forest waste. Besides the ownership of the soil of the forest, the Crown has the usual 'rights,' originated, as in other of the royal forests, by the prerogative claimed by the sovereign to hunt deer, and to provide for the keeping of deer. But the ownership of the soil and the other rights just referred to do not interfere with the rights of common claimed and exercised by all persons owning and occupying land and houses within the 'ambit' of the forest, or within the old forestal area.

We now come to the common rights *under* the soil of Dean Forest. The forest is situated within the hundred of St. Briavels; and every male inhabitant who has been born within this district acquires, when twenty-one years of age, and after having worked for twelve months and a day beyond either in a coal or iron mine, the distinction of being what is called a 'free miner,' and in virtue of this distinction he can claim to have set apart to him a spot in the forest—unconnected with existing mining works—in which he can sink a mine for coal or iron. The spots so claimed and set apart are termed 'gales.' The 'free miner,' it must be remembered, however, does not become the sole proprietor of the 'gale' allotted to him, for it is subject to a sort of royalty, or, in other words, the Crown is a fifth partner in the proceeds of the 'gale,' the 'free miner' having the other four-fifths. But before any minerals are discovered the 'free miner' must pay a small rent to the Crown; and when he strikes minerals it is usually the custom for him to compound for the share of the Crown. It is a necessary condition to the exercise of the right of a 'free miner,' that he must work in his 'gale' not less than during one day in each year-and-a-day of his occupancy of the 'gale.'

There are nearly 1,200 'free miners' in Dean Forest, and there are sixty 'gales' or thereabouts of iron and 200 of coal—about 260 in all. These are all duly registered and regulated by virtue of an Act of Parliament. No 'gale' is permitted under the 11,000 acres of forest enclosed by the Crown for growing timber, but under all the other forest land these 'gales' are legal, including curiously enough the land in private hands. But when 'gales' are under private property the owner of the property becomes a partner in the profits of mining. As a rule the free miners do not work their own 'gales,' but dispose of them to capitalists.

Now we come to the proposed legislation for the improvement of the mining villages in Dean Forest. A select committee of the House of Commons—granted at the instance of Colonel Kingscote during the session of 1874, to inquire into the condition of the villages, in their report made certain recommendations, the substance of which was that it would be necessary, as a preliminary to the requisite reforms, to acquire by commutation all the existing rights of common under and over Dean Forest: and so far as the 'free miners'' rights are concerned, to prevent in future the origination of these rights by providing by law that no person should henceforth become a 'free miner.'

The Commoners in Dean Forest, who are also 'free miners' are, as might be supposed, mostly poor, and it is probable that many of them, if not all of them, would be tempted, after the manner of Esau, to sell their 'birthright' for a consideration which might perhaps be somewhat more in value than 'a mess of pottage.' But it is obvious what the result would be. If parliament allowed the Dean Forest Bill to pass—for the bill embodies the recommendations of the Select Committee of 1874, and even goes beyond those recommendations—the acquisition of the common rights would be soon effected; and these once gone the forest as a forest in all probability would also quickly go, and the public would lose one of its most important and most beautiful open spaces. Safety lies in preventing the disposal of the commoners' rights, which are practically, so far as the open parts of Dean Forest are concerned, the rights of the general public. Even if the commoners should consent to sacrifice their rights, that consideration will not affect the question, which is one in which the public at large are vitally interested. The necessary reforms in the mining villages do not require for their accomplishment such an 'heroic' measure as the obliteration of the entire forest as an open space. But the suggested legislation aims apparently at nothing less than this, and it will be the duty of Parliament to refuse to pass the bill in its original shape, and until it has undergone much more than a 'slight modification.'

THE

SANITARY RECORD.

SATURDAY, NOVEMBER 27, 1875.

TO SECRETARIES OF SANITARY ASSOCIATIONS AND KINDRED SOCIETIES.

The Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers read before the members of any sanitary or kindred association.

THE RECENT FLOODS.

THE state of the low-lying southern districts of London during the past week or so, owing to the combined action of unusually high tides and continued rains, has been indeed most serious, and the Metropolitan Board of Works have not taken the matter in hand one single moment too soon. It appears that the report upon the condition of the property abutting upon the river, and of the exact condition of the banks of the Thames within the metropolitan area, has been already considered by the Board, and that a notice has been given of the Board's intention to apply to Parliament next session for leave to bring in a bill authorising and requiring the construction of works with a view to the protection of property fringing the river. There can be no doubt that the land on the river side extending from the eastern boundary of Plumstead parish to the western boundary of the parish of Putney, and from Barking Creek to the western boundary of Hammersmith parish, will all require to be most carefully overhauled and dealt with. And some idea of the stringency with which the matter will be treated in the near future may be gathered from the fact that powers will be secured for the central board to require the vestries, local boards, and owners of premises on the river side to make proper provision against inundations, failing which attention the Central Board will undertake the work themselves and charge the expense upon the owners, parishes, or districts. The improvements must necessarily assume the shape of embankments where these can be erected without interfering with traffic, for nothing else can be half so efficacious. All overflows upon the North side of the river have been prevented by the erection of that portion of the Thames embankment, and there are those who can still remember the Temple Gardens being completely submerged. The main difficulty will be in dealing with the river traffic on the south side; and it will be found no easy matter to please all the varied interests, and yet build up a sufficient structure to ward off the floods, which have lately proved so disastrous.

The immediate cause of the late damage is not far to seek. Owing to the construction of the Thames embankments the flood-waters had a hundred acres less to spread themselves over than they had before, and the river, too, has increased in the rapidity of its flow, and in its depth of water as well. We may at any time have a repetition of these evils, for with continued rains may come a wind in the German Ocean, and such a full sea may be rolled into the mouth of the Thames as will make itself once more inconveniently felt. It is doubtful whether within the memory of man such a flood has occurred on our noble river. Even at Staines the rooms on the ground floors of some houses were filled by the invading water, and between Thorpe and Staines the roadway was flooded to the peril of even horsemen. Over three hundred houses are affected by the inundation at Windsor alone.

The insanitary state of things engendered by the late floods has also been very considerable. In Lambeth the houses were filled up with water for some five feet in places, and not with river water alone but the currents that swept the streets were thick with the contents of the water-closets, which they had flushed out on the way. And it is easy to imagine the discomfort which would remain in any of the six hundred houses in the Wandsworth Road, when the water which stood in them had fairly subsided or been pumped out. There would also be foul-smelling mud to clear away, and it is doubtful whether this could ever be altogether removed from below the floorings, from behind skirtings, and from other points of vantage.

The authorities, sanitary and otherwise, will have plenty to do in cleansing the poorly inhabited localities where the flood ran riot, and cleansing them effectually.

Let us hope, too, that very many of the worst of the houses which have suffered will be condemned and removed, and healthy residences built upon their sites, at a proper height from the river bed.

Although the evil effects of the late floods have been mostly felt on the south side of the Thames, yet the north side has suffered somewhat seriously as well, especially in the neighbourhood of the Millbank wharves.

The Albert Embankment was, without doubt, the cause of this, as it deepened the water, and until a similar embankment is built upon the Millbank shore, the inhabitants there will never be secure from dangers of this kind. The wisest thing for the Metropolitan Board of Works to do would be to make up their minds at all hazards to erect an embankment the whole length of the river between Hammersmith and London Bridge, and also construct a permanent river wall of some kind below bridge and to the estuary.

The wharfingers should also be compelled at once to raise their wharfs pending the construction of any general scheme of embanking the river; as it is impossible to say when we may again be exposed to the dangers of an extraordinary tide. The moon is unusually near the earth, and when next she is full there may be also a strong west wind to urge the tidal wave up the Channel.

A fair idea of the havoc wrought by the floods is easy to be obtained at Princes Square, where, at the present moment, the unfortunate people are huddled together in the upper stories of the houses. The square was at least six feet deep in water, and is now a mass of filthy mud. The disaster here was so sudden that the inhabitants escaped with the greatest difficulty. Many of them had to be aroused by the police and were obliged to wade the waters in nearly a nude state. We have surely something to learn in the matter of prevention as well as of cure. It is a mercy that to an unparalleled destruction of property has not been added a wholesale loss of life.

FOOD PATENTS: IMPROVED SHERRY.

IT might be supposed that before granting any provisional specification or patent, those who are entrusted with this duty would see that no danger would be likely to accrue to the public from its general employment. An ingenious chemist may declare his invention to be for 'Improvements in treating certain descriptions of food, to improve their quality, or to lessen the cost of production.' It is alleged by some chemical authorities that alum improves the quality of bad flour by its action on the gluten, so that an 'improved' loaf may be put into the hands of a customer, and sold as of the best quality at the highest price. The Sale of Food Act has provided against the fraudulent use of alum for such a purpose, and no one would have the audacity to apply for a patent for the use of alum, whatever improvement it might be supposed to produce in the quality of the flour or of the bread made from it.

Are the public equally protected against other ingenious inventions for improving the quality of food by chemical processes? We think not, or we should not now have to direct attention to that unfortunate liquid, which is known to the British public under the name of 'sherry.' We learn from the researches of Dr. Druitt and others that 'sherry' is not necessarily 'wine,' and that it may be made from a mixture of substances quite independently of grape juice, or the process of fermentation. In fact, 'sherry' is now admitted to be an artificial compound of very variable constitution. We are informed that thousands of butts are manufactured yearly at Cette, in the south of France, as well as at Hamburg, and other places on the Elbe, which contain no Spanish wine at all, and which consist only of alcohol in the shape of indifferent brandy, water, and certain compounds, to impart flavour and colour.

It is well known that the Spanish wine-producers have a practice of adding plaster of Paris either to the grapes or the juice expressed from them (the must). The object of this addition of a mineral ingredient, like sulphate of lime is not very apparent, while its disadvantages are manifest. It tends to remove the natural acid of the grape, namely the tartaric, and to substitute for it a mineral acid, the sulphuric, forming with the tartar, the sulphate of potash which remains in the wine after fermentation. The process of sulphuring for arresting or reducing fermentation, also adds a quantity of free sulphuric acid to the wine.

There can be no doubt chemically that the 'plastering' process above described is liable to affect the flavour and character of the wine. The sulphate of lime does not, however, remain in the wine; the plaster is chemically changed, and should any escape decomposition, it would be rendered insoluble, and removed from the wine by the alcohol which is produced during fermentation.

The drinker of Spanish sherry, therefore, takes with his wine a mineral salt, sulphate of potash, with some free sulphuric acid. The proportion of the sulphate is said to vary from fifteen to fifty grains in a bottle. This would represent from one and a half to four grains in a wineglass. Admitting that the presence of this salt may affect the flavour of the wine, it is an absurd exaggeration to assert that it renders it noxious or unwholesome. One 'analytical chemist' informs the public that it is a bitter and aperient salt; and another, that it operates as a depressant on the heart. We may fairly say that the quantity swallowed in sherry is too small to operate either as an aperient or depressant. It is equally

absurd to affirm that the sherry-drinker swallows 'oil of vitriol,' owing to the presence of traces of sulphuric acid derived from the fumes of burning sulphur. Such a description is highly sensational, and is well calculated to make the sherry-consuming public tremble, and look with favour upon any analytical chemist who promises a remedy.

We have now before us a copy of a provisional specification for improving the quality of wine, especially sherry.* From a description of this purifying process, we find that the object of the invention is to remove from sherry the sulphuric acid and the sulphate of potash, as well as any free sulphuric acid in the wine, by the addition of the tartrate of barium. The tartaric acid removed by the plastering process is said to be thereby restored to the wine, while the sulphuric acid is precipitated under the form of sulphate of barium.

By a strange misnomer the patent process has been called the 'de-plastering' of sherry; and wine thus treated has been described as absolutely free from plaster! It is said to be soft in flavour and to have a much higher money value than the plastered wine. We have heard further that certain wine-merchants have been shown masses of a white substance, described to them as plaster of Paris, extracted from a butt of sherry, with a view to induce them to adopt this process.†

We need hardly remark that this is a great error. There is no plaster in the wine, and if there were, the process suggested would not extract it as such. The white substance shown as plaster of Paris was sulphate of barium.

The invention is ingenious, but it appears to us the ingenuity is misplaced. The proposition to remove a non-poisonous salt by a poisonous barium-compound, is certainly a novelty in the treatment of sherry. It is hard to say what amount of doctoring this wine has already undergone in Spain and England before it reaches the consumers. The plastering, sulphuring, flavouring, colouring, and fortifying with alcohol, are accepted stages of manufacture to which the discontented Briton must resign himself. To add to these numerous processes another for 'deplastering,' as it is termed, by the addition of a poisonous salt, is carrying matters beyond all reasonable bounds.

The patentees, apparently aware of the dangerous ground on which they are treading, affirm that 'in this process there is no possibility whatever of the wine being contaminated with even the faintest trace of barium, since the amount of tartrate of barium added to the wine is less than that required for the decomposition of the last trace of sulphate of potash, and hence every atom of barium is removed in the form of that most insoluble of all chemicals, sulphate of barium.'

We admit the truth of this statement, but the means for insuring safety, is too scientific and too refined to inspire confidence as a commercial process. It is admitted in the specification that for every bottle, gallon, or butt of sherry so treated, the proportion of sulphuric acid present, free and combined with potash, must be first determined either gravimetrically or volumetrically, and the person who adds the insoluble tartrate of barium to the wine must take care that the tartrate is effectually decomposed, and that he stops short of the quantity required to remove the whole of the sulphuric acid. Without a strict observance of these precautions the sherry is likely to acquire a poisonous impregnation of a barium salt, and we may fairly ask how are these precautions to be guaranteed?

It is surely unnecessary to reason on this point. Nothing, in our opinion, will justify the alleged purification of an article of almost universal consumption by the use of a pernicious compound like that which forms the basis of this specification. A wine merchant, who had the candour to inform his customers that his sherry had undergone the 'barium process' of purification, but that the greatest care had been taken to prevent any of the noxious substance remaining in the wine, would hardly reconcile them to the use of it. Most persons would prefer the alleged 'aperient' and 'depressant' action of the sulphate of potash to the possible introduction of any poisonous ingredient.

The proper correction of the evil would be to prevent the use of plaster at the fountain head, and not to rely upon scientific schemes for removing it or its products after it has been once introduced. Chemically speaking, it cannot be a necessary step in the manufacture of the wine, and it is highly probable that it alters the flavour and quality of the fermented product.

We began our remarks by inquiring whether there was any one to look after the public interests in the issuing of provisional specifications and patents. Under proper supervision such a specification as this would not have been granted. It would seem, however, that these matters are left to chance, or to the decision of half a dozen clerks without any chemical knowledge. An inventor may take out a patent for preserving meat in a weak solution of corrosive sublimate as an improved method of storing up food! We know of no power to prevent him, but public opinion would here operate against the inventor. There are numerous other cases in which the public could hardly judge of the safety of a process for purifying or improving the quality of articles of food, and we do not know that there is any competent official whose duty it is to advise the clerks of the Patent Office under these circumstances.

* Specification No. 2,706, by Arthur Hill Hassall and Otto Hehner. The invention is said to be for 'improvements in treating certain descriptions of wines, to improve their quality, etc.'

† In Dr. Hassall and Mr. Hehner's specification, it is correctly stated that the white substance extracted from the wine is sulphate of barium. The fact here mentioned of sulphate of barium being passed off as plaster of Paris, shows that other chemists are making use of this process.

Many years since a patent was taken out for purifying raw sugar rapidly by adding to it a solution of a salt of lead. It was then proposed to remove the lead from the clear syrupy liquid by a current of sulphurous acid gas. It was contended on this occasion that although a poisonous salt was used for the purification of sugar, it was entirely removed in the subsequent stages of the process. A commission was appointed by Government to examine some loaves of sugar manufactured under this patent. They were found to contain a lead salt in such proportion as to render the sugar wholly unfit for public consumption. Such a patent should not have been issued. Under no circumstances is it justifiable to use a noxious compound for the purification of liquid or solid articles of food, and the sooner this is brought to the knowledge of those who have the power of issuing patents, the better will it be for the public. It is clear by the sherry wine and other cases which have come to our knowledge, that there is no proper supervision of patents so as to insure safety to the public. On one point, too, we would distinctly insist. The patentee should not be allowed to be the judge of the question whether his process is or is not likely to be noxious to health. A strong feeling of self-interest is enough to overpower his judgment; at any rate, however competent an intending patentee may be to give an opinion, he is the last person who should be consulted on a subject in which he has a strong personal interest.

SCARLET FEVER AT BRISTOL.

THE present severe epidemic of scarlet fever at Bristol seems to have given notice of its approach in the autumn of 1874, when a few scattered cases made their appearance. Very careful measures of isolation and disinfection seem to have been successful in keeping the disease within narrow limits during the winter, but with the approach of the spring of 1875 and the subsequent summer and autumn the cases multiplied, until last week the large number of twenty-eight deaths out of a population of 196,000 was registered. Judging from the history of former epidemics of scarlet fever in Bristol it is not thought probable that the highest death-rate is yet reached, since, in 1870, as many as thirty-five deaths from this cause were registered in one week. The most stringent measures of disinfection and isolation continue to be diligently carried out under the careful supervision of Dr. David Davies, medical officer of health for the city. Dr. Davies is of opinion that the great fatality of scarlet fever is but slightly, if at all, dependent upon general sanitary conditions, remediable by a sanitary authority, but that it is greatly indicative of a want of, or inattention to, medical advice and want of proper care and nursing of children when recovering from the first stage of the disease. He has, therefore, caused a handbill to be issued for distribution in the city and county of Bristol, pointing out that he has reason to believe that a large number of children die from the effects of exposure to cold whilst recovering from scarlet fever, and cautioning all persons having charge of such children of the great danger of exposing them to cold for at least twenty days after the commencement of the attack, or until the skin has fully recovered its natural condition. This caution is specially applicable to children recovering from mild cases of the disease.

Notes of the Week.

HER MAJESTY THE QUEEN has subscribed 50*l.* to the funds of the Working Men's Club and Institute.

THE Wigan medical officer of health has reported the widespread existence of typhoid fever in the borough, mainly due to preventable causes.

THE EARL OF SHAFTESBURY has forwarded a donation of 20*l.* to the 20,000*l.* Building and Extension Fund of the London Temperance Hospital.

THE death of a woman named Charlotte Elizabeth Grasmarle, at Peterborough, aged one hundred years and nine months, is reported by the *West Sussex Gazette*.

THE vestry of St. George's, Hanover Square, have decided upon paving Piccadilly with the improved patent wood paving, instead of the granite paving now in use.

AN influential deputation of residents in Croydon and its vicinity, has waited upon the president of the Local Government Board to lay before him a statement respecting the late outbreaks of fever in their neighbourhood, and ask the Government to institute an immediate inquiry into their cause. Mr. Sclater-Booth said from the statements made they were justified in bringing the subject under his notice, and a definite answer should be given in as brief a space of time as possible.

THE Registrar General, in his last weekly return, calls attention to the fact that no death has been referred to small-pox during the past four months in London, which has an estimated population of 3,445,160, although the corrected average number of fatal cases of this disease in the corresponding period of the last ten years is 337. This complete immunity from fatal small-pox in London for so long a period, without parallel since civil registration was established, is stated to be entirely unprecedented.

SIR JOSEPH BAZALGETTE has given it as his opinion that the only way to dispose of the sewage of the Thames Valley is to remove it from the neighbourhood, and has submitted a joint Thames Valley and Kent scheme, which he estimates would cost 500,000*l.* That sum could be borrowed for a term of sixty years and paid off with a 6*d.* rate on a rateable value of the Thames Valley. He proposes to retain the solid portion of the sewage and utilise it over fifteen acres of land at the outfall, or sell it as manure.

THE HEALTH OF ETON.

WE are enabled on the best authority to contradict the statement that typhoid fever has made its appearance at Eton College. We have the most reliable assurance that not a single case of typhoid exists at the present time either in the school or parish, and that the health of both is generally good.

FEVER AT UPPINGHAM.

DR. THOMAS BELL of Uppingham writes to us:—

'I deny the right of the sanitary authority to censure a medical practitioner entirely unconnected with them. I deny the power of the medical officer of health to summon me to a meeting, which he did verbally through the inspector of nuisances.

'I distinctly deny that I withheld information; as previous to the meeting, I had had two or three conversations with Mr. Haviland, and answered all his questions, and had daily been called upon by the nuisance inspector, to whom I had given all information in my power.'

THE ARTISANS' DWELLINGS ACT.

THIS Act continues to do good service, if only in inducing compulsory inspection of and investigation into the state of the habitations provided for the labouring poor of London. In the course of a discussion on proposed improvements at the vestry meeting of Bermondsey, the chairman remarked that when the committee went round the parish to see the condition of their property, they were amazed at some of the dwellings of the poor, many of the habitations being of such a description that they were unfit for dog-kennels, and he had made up his mind not to rest until the parish had been purged of such disgraceful hovels.

PARAFFINE LAMPS.

AT an inquest held last week on the body of a man who had died from burns received through the upsetting of a paraffine lamp, Dr. Hardwicke said that no less than seven deaths from similar causes had occurred in London during the past week. This large destruction of life seems to point to the necessity of more stringent regulations as to the sale of unsafe lamps, constructed only to sell, regardless of consequences, and highly inflammable spirit, with which to feed them. At any rate directions for the use of these paraffine lamps, pointing out the care necessary to ensure safety, should be sold with them, and it would be well if some similar precaution could be made compulsory on the sale of the 'benzoline' and other highly inflammable petroleum derivatives.

EDUCATION IN COOKERY.

MR. JAMES COWAN, M.P., presided at the inaugural meeting of the Edinburgh School of Cookery. It is satisfactory to hear that nearly a thousand ladies were present to hear Mr. Buckmaster's address, which dealt chiefly with Scotch cooking and Scotch dishes. The chairman said the Education Act for Scotland did not empower the school board to give money for instruction in cookery, but he hoped the question would be pressed on the Government, who, he believed, would not be indisposed to encourage cookery as part of the education of girls, and he believed the ratepayers of Scotland would cheerfully give a portion of their money for such a purpose. He hoped there would be such modifications in the Scotch code as would enable them to do so. He thought 5*s.* should be paid for a theoretical knowledge of food and cookery, and an additional 5*s.* for every girl that could expend a shilling so as to provide and cook a good wholesome meal for a family of six persons. It seemed to him that there was no knowledge in the house of a working man of so much importance. The chairman of the school board at West Calder said that nothing would be done until cooking was made part of the education of girls, and paid for the same as drawing and science. The school boards in other parishes have similarly expressed themselves, and the chairman of the Glasgow School Board, Mr. Alexander Whitelaw, M.P., has promised to represent to the Committee of Council the desirability of extending the Scotch code so as to include cooking and other modifications.

FOUL CISTERNS.

MAJOR FRANK BOLTON, in his report on the water-supplies of the metropolitan water companies, made in October last, states that many of the causes of complaint received by the Local Government Board as to the quality of the water delivered for domestic purposes by the metropolitan water companies are found on inquiry to be attributable to the dirty state of the cisterns on the premises of the complainants; all cisterns should, therefore, be frequently cleaned out, and every care taken by the consumers to prevent the contamination of the domestic water-supply after delivery on their own premises.

He also points out that the contamination of water from the gases generated by sewage is of far more frequent occurrence than is generally understood. The gases are extremely liable to flow back into the cisterns and become absorbed by the water, unless the overflow-pipe is brought outside the house and the end left exposed to the air, instead of being carried into the drain. The adoption of this plan will effect an object of great importance by getting rid of the poisonous effluvia and gases from the drains which would otherwise ascend through the pipe, and not only be partly absorbed by the water in the cistern, but be partly mixed with the air in the houses, thereby becoming a cause of fever and disease.

BATHS AND WASH-HOUSES IN ST. PANCRAS.

AT the last meeting of the St. Pancras Vestry a report was brought up recommending that additional baths and wash-houses should be erected in the southern part of the parish. The report showed that the baths and wash-houses already established in King Street, Camden Town, had been remarkably successful, and were now inadequate to the requirements of the parish. A statistical return showed the number of bathers at King Street in 1869 had been 145,785, which had risen to 200,000 last year, the total from the beginning being 1,192,679. The washers, too, had increased from 9,425 in 1869, to 29,808 last year. The pecuniary success was quite as striking. The present establishment cost 23,000*l.*, and after paying all working expenses, a profit of 5,942*l.* 16*s.* 6*d.* had been realised, as between receipts and expenditure. These results tend to show that the conveniences offered by public baths and wash-houses are appreciated by the class for which they were intended. This is a most satisfactory assurance, since it is impossible to over-estimate the sanitary and social advantages dependent upon a wider diffusion of habits of cleanliness amongst our working population. The difficulties attending personal cleanliness are so great in the confined homes of the artisan classes that every addition to their means of washing and bathing must be hailed as a fresh instrument of social and sanitary progress.

OLD CHEESE.

A CASE of much importance to cheesemongers was heard last week in the Queen's Bench Division 'in the matter of a by-law of the Corporation of Doncaster.' Under this by-law the corporation direct the infliction of a fine of 20*s.* upon every dealer in meat, etc., 'who should have or expose for sale in the borough, or have in his possession with intent to sell, any unsound, putrid, or unwholesome fish, meat, or other victuals or provisions unfit for the food of man.' In August, 1874, the appellant in the present case was summoned for having cheese on his premises which smelt so strongly that it attracted the notice of passers-by. The cheese, which weighed 10 lb., was seized by the inspectors and the owner summoned. The magistrates came to the conclusion that the cheese was decomposed and unfit for human food, and imposed a fine of 10*s.* on the defendant. The evidence in the case was somewhat contradictory; and a medical witness, examined for the defence to show that the cheese was not unfit for food, said that 'any cheese taken in large quantities is un-

wholesome,' and, though he admitted that this would be so taken to a great extent, he did not think it necessarily in a small quantity unwholesome. However, the magistrates convicted the defendant, and he appealed upon a special case to this court. Mr. Lockwood, on behalf of the appellant, argued that the by-law was not warranted by the Act, as this was not a case of nuisance, for it was merely a case of rotten cheese, which many persons liked; but as to this, Mr. Justice Quain observed that although no doubt many persons liked cheese which was 'mity,' the magistrates here had found, as a fact, that the cheese was unfit for human food. The conviction was affirmed and the appeal dismissed.

USEFUL RECOMMENDATIONS.

THE Nantwich Rural Sanitary Authorities have just issued a memorandum for the information of owners and occupiers of property within their jurisdiction, which appears to be a very admirable one. The remarks upon the water-supply are sound, but we think that when persons are recommended to use animal charcoal in their filters, that care should be taken that the animal charcoal should be of the very purest description. The remarks upon cesspools are very pertinent, and if followed out would benefit any neighbourhood where a sewer system does not yet prevail. But we do not quite fall in with the remark that there should be no drain from the cesspool, for in most cases an overflow is desirable, if only to remove the excess of fluid waste, though we quite fall in with the remark that the sub-irrigation principle should be adopted as much as possible. The recommendation as to the non-erection of piggeries nearer than fifteen yards from any dwelling is especially worthy of being copied in rural places, and so is that rule which forbids any privy within five yards from any tenement to be constructed otherwise than on the pail, ash, earth, or other dry system. There is also a very proper remark made to the effect that wet subsoils under and in the neighbourhood of houses, should be effectively drained.

THE HEATING OF MODEL LODGING-HOUSES.

IT has been suggested by Mr. Eiloart, who had for some years the management of the buildings erected by the Society for Improving the Dwellings of the Industrious Classes, that stoves and grates should in future be dispensed with in the rooms of any new establishments for working-men, built under the Artisans' Dwellings Act. He has found that the chief difficulty of the inmates has been in the storing of the coal and other fuel in their rooms, and that, when to this was added the subsequent disposal of the ashes, the nuisance became a grievance. He recommends that the buildings should be warmed throughout upon some principle which will, whilst heating the rooms, furnish at the same time a constant supply of hot water to the tenants. The suggestion is an excellent one, and fortunately there is a system of heating extant which is equal to both services. With the common method of heating by hot water of course it is not possible to withdraw any of the circulating water, nor would it be pure if it were withdrawn. But with the cylinder system the water can be withdrawn at any time from the pipes and the circulating water can be as pure as possible. The cylinder is always kept full, and as the water heats, it courses along through the heating coils, which, however, can be fitted up with stop-cocks should the heating not be necessary.

There is no possibility of any explosion of the boiler, for the boiler holds but a few quarts of water, and the cylinder cannot possibly suffer from the effects of frost. The only fire that would need attention would be one in the basement floor, and that could be fitted up with the slow combustion furnace. We understand that Mr. Eassie has adopted this method of hot-water supply and has found it to answer admirably. With it a house can be heated with hot water, and the same water can be drawn off at any level for culinary or ablutionary use.

ALLEGED REMOVAL OF THE CONTENTS OF CITY GRAVEYARDS.

FRESH complaints have just been made in our contemporaries of the digging gravel and sand from the sites of intended houses, and filling up the holes with refuse of the most abominable kind. One of the latest has just appeared in the *Builder*, and is stated to have occurred on the borders of Victoria Park, or rather in a space of ground which is situated between two divisions of the park. The ground was dug out and the gravel and sand removed to a depth of from six to eight feet, where the houses were to be built, and to a much greater depth for the roadways, and the holes then filled up with filthy refuse, including human bones. The writer suggested that these came from some condemned city churchyard, but we are unable to affirm or object to his supposition, in consequence of the houses having been built some short time since. We have repeatedly called attention to this shameful state of things, and shall continue to do so until these deposits are discontinued. The matter is aggravated in this particular case by the unusual depth and extent of the excavations and subsequent deposits, as well as by the houses having a 'most respectable and genteel' appearance, and being known to be situated on a gravelly soil, so that occupiers and intending purchasers would scarcely think of making inquiry into the character of the subsoil.

Neither the local authorities nor the Metropolitan Board of Works can prevent these abominations, because the matters deposited cannot be shown to be injurious to the health of individuals. The various sanitary Acts in force in the metropolis were all framed in favour of owners of property, so far as to prevent them from being made responsible for the removal of mere nuisances. It is quite time that the sanitary laws of the metropolis should not only be collected into one Act as those for the rest of England were in the last Public Health Act, but that the list of nuisances should be much extended, and the rights of property somewhat curtailed for the general well-being of the public at large.

DEATHS NOT CERTIFIED.

DR. GOLDIE, medical officer of health for Leeds, makes some remarks in a recent report which are worthy of public attention:

I am anxious to mention some facts with regard to those deaths not certified. First, you will find them chiefly amongst children under the first year of life, and the characters of those diseases which are generally put down at 'hap-hazard' as the causes of the deaths are either diarrhœa or some convulsive disease. Then, you may ask, why term those deaths uncertified which have some account given of them? It is this, that some one recognised by the people as a medical man has certified as to the cause of death; but when this certificate comes before our registrars they are bound to state that the death is uncertified, from the fact that they are unable to find the certifier on the list of registered practitioners. Those certificates are generally from chemists and unqualified practitioners. And here let me show that chemists and such like persons are not altogether to blame for this. I have taken special care to ask many of my colleagues if they are much consulted about diarrhœa at present, and their answer has been 'No; I am astonished at your reports of the number of deaths from this cause.' Now I am not astonished. I am certain they are correct, because any person, chemist or otherwise, with ordinary common sense, can diagnose a case of this kind. The analysis of the whole secret I find is this; that mothers generally endeavour to treat the cases at home, either from a pecuniary motive or a total indifference to the troubles of their young. They allow the disease to sap the constitution till they see danger and death near at hand; then they run to the first shop at hand with the sign of a druggist over its door, very anxiously seeking assistance, when neither the ordinarily skilled chemist dor the most erudite physician in the world could do anything that would stop

the child from dying. Medicine, however, is given, and the deluded mother (consoled that she has done something towards the cure, which she cannot have been anxious about), returns home. Her child dies, and the only person able to give her a certificate of death is this unfortunate chemist. Now what I wish to show is that this chemist is not to blame, but the people themselves. They don't wish any better result than death, but only that they should be screened from an inquest. I would have every one of the cases uncertified made the subjects of a most careful inquiry before the coroner. I am certain I have not said too much upon the subject, because its importance far exceeds any talent I possess to treat it with exhaustive justice.

THE VENTILATION OF MINES.

AT the annual meeting of the Institution of Mechanical Engineers, held at Manchester on the 5th inst., Mr. W. P. Marshall read a paper on mechanical ventilators for mines, in which he said that in a paper on mining machinery read before the Institution sixteen years ago, by the late Mr. T. J. Taylor, the ventilation of mines by furnaces placed at the bottom of upcast shafts, as compared with the mechanical appliances then in use, was for valid reasons considered the best and safest method. But, notwithstanding its admitted simplicity, the rarefaction of the outgoing air by heat to produce the ventilating current had proved troublesome, expensive, and dangerous. Under these circumstances it was not surprising that, since the subject of mechanical ventilation was last brought before the Institution six years ago, the adoption of the greatly improved mechanical appliances then described for the ventilation of mines should have been so extensive, that in this country there at present were about 250 mechanical ventilators in actual use or in course of construction. In the matter of fuel consumption, the best existing appliances would be about on an equality with furnaces when the latter were employed at a depth of about 700 yards, and the less the depth the greater did the economy of the machine become; but it might certainly be asserted that the furnace ought never to be employed excepting in small mines, where the duration of working and physical conditions were such as not to justify the additional outlay required for a fan. Most, if not all, of the mechanical ventilators at present in use exhaust from the top of the upcast shaft in the case of pits, or at the end of the return air-course, where they were employed for day working. He submitted a statement of the results of experiments on some of the different systems for the mechanical ventilation of mines, and in conclusion called attention to the fact that, in the majority of ventilators now working, low pressures, very little expansion, and consequently wasteful types of engines, were usually employed, where, owing to the almost constant work, a more economical type of engine might be advantageously adopted.

Special Report.

THE TYPHOID EPIDEMIC IN CROYDON.

BY ALFRED CARPENTER, M.D.

TYPHOID fever has appeared again at Croydon, in a manner which is worthy of the serious attention of all those who study the causation of that disease. We have learnt much of its natural history from its periodical outbreaks in our district. On several occasions it has been traced home to its source, and its method of distribution clearly made out, because the disturbing causes which so often exist in other places are wanting in Croydon.

It is now ten years since anything like a wave of typhoid has been so manifest as to occasion such an epidemic as has recently arisen. A variety of circumstances appear to be requisite for its production, and as they continue one by one to be recognised by sanitary students and brought to the knowledge of those whose duty it is to enforce sanitary laws and to prevent their effects, so the periodical invasions of the disease become less and less frequent. Time was when every wet season brought its typhoid wave into the bed of drift gravel which intervenes between the chalk and the London clay. A rise of the water line, by flooding the shallow wells with water from impure sources, led to fever. In a dry season, also, the soakage into the wells from neighbouring cesspools gave a similar result. Very wet seasons, and also very dry seasons, produced an epidemic. These conditions, when recognised, showed the necessity for sanitary supervision, and called attention to the drainage of the district. A sanitary board was formed, which embodied the wisdom of the neighbourhood as well as some of the ignorance. The whole district was drained, and the water-line lowered some eight or ten feet. The drains were placed so as to keep the level of the water nearly steady. In dry seasons the sewers were above the water-line; in wet seasons they kept the water-line from rising more than a foot or so above them, because the larger portion of the drains consisted of socketed pipes caulked with clay. The caulking was so managed that it soon fell away, and allowed free exit of sewage and entrance of subsoil-water. No regular arrangement was made for ventilation, and no measures taken to guard against the evils consequent upon settlements in the sewers, the level was lost and deposit took place. These defects in construction produced fresh evils. The mischiefs resulting from differences of level in the subsoil-waters were materially decreased, but foul gases were driven into the houses of those who became connected with the sewers, and an epidemic of typhoid rapidly followed the formation of the drainage area. This epidemic was coincident with a typhoid tendency which spread over the country in connection with a stormy season and a heavy rainfall. The disease did not depart for many months, and was partially remedied by the insertion of a few ventilations in the main-sewers.

Fever continued to arise occasionally, and individual houses, or sets of houses, at long or short intervals, suffered. The cause was traced to defective sewers, to contamination of water-supply of a local character, to want of general ventilation, and various other causes which were thought to be as local as was each distribution of the disease. But in 1865 a much more severe outbreak occurred. A series of cases were simultaneously fatal, almost all of which took place in houses situated at the end of a line of sewers farthest from the outfall, all in new houses, or extensions of sewer which had been carried out since the first arrangement of drainage area, and all were traced to a want of ventilation in the sewers themselves. The points of most importance were put before the local board of health by myself, and it was agreed to ventilate the whole of the sewers in a systematic manner; the ventilation of the soil-pipe of every new house was also insisted on, and all overflows were ordered to pass into the sewer by indirect channels only. These rules were agreed to by the board about Christmas, 1865, and as they were carried out fever disappeared from Croydon, its departure keeping such pace with the operations of the workmen as to show most clearly the connect-

ing link between the want of ventilation in the sewers themselves and typhoid fever; but all the changes were made unwillingly by the builders. The local board did not at that time agree to all my propositions. They refused to pass a resolution that 'no pipe conveying water from the water main should be allowed to come into direct communication with the sewer or house-drain.' It was agreed to apply the rule to all new houses, but in the case of property already supplied with water they refused to interfere, and thus left 3,000 water-closets *in statu quo*, allowing a common law of hygiene to be ignored, and thus at some future time to bring suffering and death among the inhabitants of Croydon. They also refused to agree to a rule calling upon builders to lay their house-drains upon solid ground, or on concrete, and to concrete the joints. The rule that cisterns were absolutely necessary for all water-closets was made to apply to all new buildings, but the old property was left without the protection which a cistern affords against water contamination. The supply in these cases mentioned was drawn direct from the main by the agency of a screw-down tap. When, therefore, the supply was cut off and the main emptied, it could under certain circumstances get its supply of air from impure sources.

Nevertheless the works carried out in 1866 rendered the district all but free from typhoid for a period of nearly ten years. In the spring of this year the local authority, in spite of my opposition and strong protest, gave the parish an intermittent water-supply for a week. Immediately afterwards a typhoid epidemic set in with considerable severity, and by the end of June thirty-four deaths and 400 cases were reported by the medical officer of health to the sanitary committee of the local board.

As chairman of that committee I urged upon the board that the intermittent supply was the prime evil, and that the epidemic was caused by the water. It was at first, and indeed for a long time, denied that there was any typhoid; then that it was not peculiar to Croydon, and therefore need not trouble the thoughts of the board; then it was atmospheric; everything was blamed with which the board had nothing to do: but they would not agree to my view that its cause was distributed in the water. Time passed on, the fever declined, and then all but departed, when at the end of September another wave of disease spread over a portion of the water district soon after another intermittent experiment, which brought such evidence that water was the cause that even the Croydon local board were not proof against it, and a majority agreed to adopt all the suggestions that I had previously made.

The evidence that it was in the water consisted first in the complaints made by many persons that the water was not so good as usual. This complaint was irregular and confined to a few houses at distant parts of the district, not to one main but in a variety of places. Secondly: The persons affected consisted in a great measure of water-drinkers. Third: In one district in which the mains of a rival company (the Lambeth) occupied one side of the road, and the Croydon works supplied the other, the fever only arose on the side supplied by the Croydon main, whilst the sewer ran along the middle of the road and was common to the houses on both sides of it. Fourth: Persons had the disease who were connected with the water-works, but not in the drainage area. Fifth: Those living in the drainage area and not connected with the Croydon water-works in a great measure escaped. Sixth: Those cases which were found in the drainage area had moved out of the water district, whilst those in the water district and not in the drainage area had not so moved from one place to the other. Seventh: There were many other striking instances, such as a large number of persons affected being in the habit of drinking a glass of water the first thing in the morning as soon as they got up, the water being that first drawn from the tap. And, lastly: The discovery by Dr. Philpot, the medical officer of health, of several places in the services by which contamination must necessarily have arisen whenever the water-supply was intermittent.

These facts so satisfied the local board of the truth of my opinion, that they have resolved to carry out the two canon laws of hygiene with reference to drainage and water-supply, and thus prevent in the future the remotest chance of water contamination.

The first law is that 'No pipe conveying water for any purpose from a water main should ever come into direct communication with a sewer or house or house-drain of any kind.'

Secondly, that no sewer or drain conveying slop-water or sewage should ever be so constructed as to allow of the gaseous products of change in the contents of the sewer to find their way directly into the houses, without the gases, in the first instance, being diluted by mixture with the outside air.

Under this law all connection between the sewer and the house would be indirect only.

The fever, as far as Croydon is concerned, is rapidly declining; no fresh cases have been reported for the past three weeks, although it is certain that sporadic cases will occur, because too many people continue to live in houses which are badly drained, and which have unventilated sewers in intimate union with their dwellings.

It has been determined that whenever, from the nature of things, an intermittent supply, such as was given on March 16 and September 16, becomes again necessary, the inhabitants shall be warned of the same and advised to boil their water before drinking it for at least twenty-four hours after such intermission.

And lastly, the local board have determined to insert air-valves in all the water mains which require them, so that for the future air may be provided from pure instead of impure sources. These arrangements, I feel convinced, will prevent any similar epidemic in Croydon for all future time, unless the lessons now learnt are entirely forgotten. Soon after the second epidemic appeared the medical men of the district addressed a memorial to the board which contained some suggestions, and to that memorial the clerk was directed to make the following reply. As it contained some general information which may be useful elsewhere, I append it as sent out to my fellow practitioners in Croydon.

CROYDON LOCAL BOARD OF HEALTH.

Town Hall, Croydon,
November 15, 1875.

DEAR SIR,—I am directed to acknowledge the receipt of a memorial addressed to the local board of health, and which has been signed by you with a large number of other medical men practising in Croydon, regarding the appearance of typhoid fever, etc., etc. I am instructed by the local board to convey to you their thanks for the sugges-

tions contained in that memorial, and also to inform you that the board has given such directions as appear to be required for the prevention of similar outbreaks of disease for the future. The sewers are, and have been for some time, daily flushed from above downwards, and disinfected by large quantities of disinfecting material, as recommended by our medical officer in the month of April last. The board would, however, draw your attention to the fact that, after all, the most important part of the value of disinfection lies within the power of the medical attendant upon the sick more than in the hands of the board, viz.—the disinfection of the excreta of the patients immediately after their passage from the body, and before they are allowed to enter the sewers. I am requested to ask for that which has probably been already accorded by the memorialists, viz.—the co-operation of the medical men of the district, in seeing that this most important preventive measure is properly carried out. The local board are prepared to send men to flush and disinfect the house-drains wherever there are cases which you consider to require the same, on signifying your wish in writing to the medical officer of health. Any house which appears to you to have any sanitary defect will also be inspected by a competent officer, who will advise the occupier as to the remedies which are required for the removal of the defects, if you will kindly signify the same in writing to me. Occupiers have been invited by the local board to seek the advice of the proper officers ever since the outbreak of the first epidemic in March last. I am also to inform you that the poor have been supplied with disinfectants in every case requiring them which has come to the notice of the sanitary officer (free of charge), and all means used by those officers which science has shown to be effectual for the removal of the consequence of the outbreak. This action will be continued as long as it is found necessary. The printed copies of instructions* for the prevention of contagious diseases, with which you have been already provided, can be had at any time on application to me. The board have, coincidently with the receipt of your memorial, determined to give notice to all persons concerned, that direct communication between the water-service and the sewers cannot be allowed to continue, and all persons will be advised to remove their screw-down taps and substitute cisterns for the supply of water-closets. The Act of 1875 gives local boards power to effect this most desirable change, by the agency of clause 17 of the Water-works Clause Act, 1863, which imposes a penalty on all persons who continue to use such contrivances after notice has been given by the board for their removal. The board would also ask you to use your influence with occupiers to prevent them from destroying the efficiency of their drainage works, by altering the same without communication with the local board.

Overflow pipes are made to pass directly into the sewers. Ventilating shafts are removed or placed in useless positions after houses have been reported upon by the proper officer. Sinks are put up having direct, instead of indirect, communication with the sewer; and traps are removed and drains tampered with in ways which are injurious to the people affected, and of which the local board can have no cognisance until an epidemic arises. All these things are done in direct contravention of the by-laws of the board. Your assistance in suggesting applications to the proper office, for advice before alterations are made, would be most useful. In conclusion, I am instructed to inform you that the board receive your expression of confidence in their medical officer with much pleasure, and to assure you that the board will, with that officer, consider any suggestion you may make, and beg to thank you for the interest you have evinced in the welfare of the parish of Croydon. I am, dear Sir, yours faithfully, R. J. CHEESWRIGHT, clerk.

* These are based upon the recommendations of the medical officers of health.

Law Reports.

BRIEF NOTES OF CASES.

By-Laws.

1875. *Mayer* v. *Burslem Local Board.*—'Public Health Act, 1848,' section 87. Division of district for rating purposes. By-laws respecting the alteration of resolutions. (39 J. P., 437.)

General District Rates.

1875. *London and North Western Railway* v. *Tring Local Board.*—'Public Health Act, 1848,' section 89. The repair of highways out of the general district rate is to be a temporary arrangement, lasting so long only as rates need to be levied for works of paving, etc. When such rates cease, the power to levy a highway rate revives. (*Local Government Chronicle*, June 19, 1875.)

'Public Libraries' Act.'

1875. *Donovan* v. *St. Matthew Bethnal Green Vestry.* 'Public Libraries' Act,' 1855. Held that a poll may be demanded by the party defeated on the show of hands. (39 J. P., 502).

Water Company Powers.

1875. *Low* v. *Lambeth Water Company.*—Bill to restrain the defendant company from cutting off water used in a garden. Bill dismissed. The proper remedy being at law, and watering a garden is not a 'domestic purpose.' (*Times*, July 7, 1875.)

THE METALLIFEROUS MINES ACT.

IN consequence of the recent case of suffocation in Great Wheal Lovell Mine, Dr. Le Neve Foster, the Government inspector, instituted a prosecution against the manager of the mine, Captain Priske, for not causing 'an adequate amount of ventilation to be constantly produced to such an extent that the shafts, winzes, sumps, levels, and working places, and the travelling roads to and from such working places, were in a fit state for working and passing therein.' When the case came before the Helston magistrates, Captain Priske admitted the offence; but it was contended on his behalf that it was an error of judgment, and not a wilful evasion of the Act. The magistrates taking this view of the case, and Dr. Foster not pressing for a heavy penalty, as it was the first prosecution in the district, the defendant was let off with a fine of 10*l.* and costs.

CONVEYING FEVER PATIENT IN A CAB.

AT the Clerkenwell police court, S. Longley, a labourer, has been summoned for having unlawfully exposed his daughter in a hackney carriage, he at the time knowing that she was suffering from a dangerous disease.—On October 23, the defendant engaged a cab to drive him and his daughter to the Fever Hospital in the City Road. The cabman did so, and when he got to the hospital he was informed that the daughter was suffering from scarlet fever, and that he must have the cab disinfected. He took his cab to the police-station, and there it was detained for some hours until it was disinfected. The surgeon stated that the case was one that could have been readily distinguished as one of scarlet fever.—The defendant said that he was very sorry for what he had done, in ignorance of the law.—Mr. Cooke fined the defendant 40*s.* and costs, or in default, one calendar month.

SMOKE NUISANCE.

R. JACKSON, foreman at Milburn and Co.'s engineering works, Hatcham, appeared to a summons alleging negligence in the working of a furnace, causing a nuisance by the non-consumption of smoke.—Tungate, a constable, gave evidence as to two emissions of dense black smoke from a shaft, lasting seven and ten minutes respectively, and

that on entering the works and seeing the stoker the latter said he could not do better with the fuel he had to use, which was very small.—Mr. Sandison, the Government inspector, said the furnace was one of an approved construction for the consumption of smoke from proper fuel, but it was impossible to consume the fuel used without the smoke escaping. On visiting the premises he saw defendant and Mr. Milburn, the managing director, who told defendant that he must get better fuel.—Mr. Gibbins, barrister, contended that no conviction could take place. The words of the section of the Act under which the proceedings were taken had no reference to the quality of the fuel used in furnaces properly constructed for the consumption of smoke. If the decision of the Court was against him, he should ask for a case to be granted for the decision of a superior court.—Mr. Balguy said he was clearly of opinion that an offence under the Act had been committed in sufficient care not having been used. He should impose the full penalty of 5*l.* and 1*l.* 8*s.* 3*d.* costs if a case were applied for, which he was prepared to grant; or remit the fine to 40*s.* and the costs named if a case was not taken.

Correspondence.

VITAL STATISTICS.

(*To the Editor of the* SANITARY RECORD.)

SIR,—I shall be glad if you will permit me to reply as shortly as possible to the criticism from Dr. Vernon on my recent report in his letter published in your last issue. It is encouraging to find that my pamphlet has called forth not only a very thorough analysis and a favourable criticism from your reviewer, but also so able and discriminating a comment as that of Dr. Vernon. There are, however, two very distinct points in Dr. Vernon's letter, which seem to call for a reply from me.

1. With regard to the value of sanitary statistics as we are at present able to obtain them, I would observe that Dr. Vernon censures my conclusions as too sweeping, but I fail to find any evidence in his letter to support his censure. He admits quite enough in the way of premises to support my conclusions, and is even more severe upon the Registrar General's nosology than I have ventured to be, though perhaps not too much so; and he omits to notice my main point, viz., that the value (?) of sanitary statistics being what it is, nothing can be more absurd than to require a large expenditure of time and labour upon them by the health officers, and to throw away the public money upon publishing the questionable conclusions of the Registrar General upon his still more questionable facts.

The relation between a sanitary statistician—his conclusions and his facts—appears to me, in most cases, to resemble very closely that which Aaron, in the Mosaic history, describes as subsisting between himself and the golden calf. 'The people gave me (their golden earrings), and I cast them into the fire, and *there came out* this calf.' It does not seem to have occurred to Aaron that what he had to deal with was gold and not calves, and that a little difference in his own manipulation would have brought out a monkey or a serpent instead of a calf, if it had been his pleasure so to do. We should never forget that so-called statistics form at the present day the most fashionable of all machinery for gulling the public. Anti-vaccinationists, homœopathists, and all other conceivable classes of impostors, commonly commence their deceptions with a parade of statistical results; and, in point of fact, the statistical method, instead of prescribing a royal road to all manner of knowledge, is one which demands the most careful study, the most painstaking accuracy in the treatment of details, and the most scrupulous moderation in the statement of conclusions, if it is not to lead us to mistake pretentious ignorance, or intentional imposture, for exact knowledge; and in all these requirements, except perhaps the first, sanitary statistics, as we at present have them, notoriously fail.

2. But there is another subject mentioned in Dr. Vernon's letter which seems to me to be of far more importance at the present moment than even the appraisement of sanitary statistics. Dr. Vernon takes me to task somewhat sharply for what he calls my 'fierce invectives' against local authorities. In this, I think, he does me somewhat less than justice. If he had read my remarks on these subjects with any care he would have seen that I do not vituperate these bodies in the indiscriminate way which his criticisms would suggest. I must point out that, like other organisms, they act 'after their kind,' and that their 'kind' is one which from the nature of the case is unfitted to carry out sanitary work to any good purpose. Dr. Vernon, it would appear, is a great believer in 'local self-government.' I, on the other hand, believe that 'local government' is in most cases only a euphemistic phrase, having much the same meaning as 'general anarchy,' and that to entrust local bodies with sanitary administration, except under the strictest control, is only to ensure a maximum of expense with a minimum of efficiency. Again, in putting aside my suggestion of a possible English Jacquerie if our poorest classes are permitted much longer to 'stew in their own juice,' as too many of them do now, Dr. Vernon expresses his concurrence in the regulation belief as to the stability of the English middle classes. Here, too, I have the misfortune to differ radically from Dr. Vernon. I look upon it that since 1832 the English middle classes have had far too much their own way, and that at the present moment any oppression which the poor suffer at all they suffer at the hands of the middle classes almost exclusively, and more particularly of the lower portion of them—small shopkeepers, publicans, and low attorneys. This is exactly why no real sanitary improvement is to be looked for from local bodies. Such bodies are in effect the elect of this very lower middle class, and they admit of the intrusion of no other motive for human conduct high or low than that of 'keeping down the rates,' and this in the most direct, immediate, and unintelligent fashion.

GILBERT W. CHILD.

Oxford, November 23.

THE GOUX SYSTEM.

(*To the Editor of the* SANITARY RECORD.)

SIR,—Mr. Haviland is quite right, in his letter of the 6th inst., p. 346, in thinking it not at all queer that this system should be called after M. Goux, and I never said it was so; what I think queer is, that Mr. Haviland should call that by which sewage is not disposed of—one which leaves what is called the sewage difficulty unremoved in any case, unrelieved in most instances, and increased in many—a system for the disposal of sewage. If Mr. Haviland had had a tithe of my experience he must be quite aware that just complaints of the evils of sewage were frequent long before the use of water-closets became common, and are still so in places where they are almost unknown; and without doubt they will continue so long as sewage is either allowed to flow into streams or to stagnate and putrefy near dwellings. Mr. Haviland kindly gives me leave to use the term sewage in its proper sense, that in which it has always been used ever since it was used at all, namely, to designate the foul water conveyed in sewers, whether it contain what he calls sewage or not; and as I prefer to write in English rather than in Havilandee, I will continue that use of it as long as others do.

I do not, however, wish to quarrel with Mr. Haviland about a word, or, indeed, about anything; so if he chooses to confine the use of the word to water-closet drainage, I have no objection to *him* doing so, though he will find it inconvenient to use a common term in an uncommon sense, especially if he also uses it in the common sense as well, as he does in this very same letter at p. 346, in which he speaks of the sewage of London forming a shoal

in the Thames. Now if this were correct, as it is not, it is certain that no such shoal could be formed by what Mr. Haviland says he means by sewage—urine and excrement. If a shoal were formed at all it could not be by that which is either soluble or easily suspended in water, but only by solid and insoluble matter (such as grit and sand), and the formation of a shoal so caused would be an excellent reason for excluding sewage, in the ordinary sense of the term, from the river, but a very bad one for excluding sewage in Mr. Haviland's sense of the term, from the sewers, which is his queer conclusion. Mr. Haviland says there is no need for me to record my opinion that water-closets are means of civilisation, and perhaps the opinion is too like a truism to need recording, at least it seems so to all who have had the opportunities I have had (which Mr. Haviland, I presume, has not), of observing the wonderful improvement in health, comfort, and decency produced by the universal introduction of these means of civilisation in places where they were previously almost unknown.

I quite agree with him, that whether sewage forms shoals in the Thames or not, or whether water-closets are used or not, it should not be allowed to flow into any river at all except during very high floods, when it cannot be prevented, and when it will do little or no harm. Its only proper destination is on to the land, where it will be not merely perfectly harmless but highly beneficial, especially if not deprived of its most fertilising portions. To this common-sense proposal the opponents of water-closets offer a very queer objection. They assert, and I suppose think they believe, that if sewage, which is simply very diluted manure, be put on the land, it will be far more offensive than dry manure would be, which has no effect until it is diluted. It is hard to understand why diluted manure should be worse than manure diluted, but we are told it is so, and are, of course, bound to believe it, though, according to our own observations, it is just the reverse—that dry manure is often offensive until it is wetted by rain; while liquid manure, even if strong enough to be offensive, is so for a very short time, while that much diluted is not so at all. Again, these opponents put another strain upon our credulity by asserting that if excrement be covered by a mere sprinkling of dry earth, it is rendered inoffensive and harmless; but that if the same excrement, mingled with a large quantity of water, be spread upon the land, so as directly to soak into and combine with many tons of soil, it will render that soil fearfully and dangerously offensive. It is not easy to believe either of these propositions; and anyone who can convince himself that both are true, must have convincing powers that are truly enviable.

That there are difficulties in the disposal of sewage is well known; but there are few which in most places could not be avoided by a few simple and just modifications of the law, the difficulties being legal, and not either physical or economical. H. H. P.

COMBINED SANITARY DISTRICTS IN WALES.

(*To the Editor of the* SANITARY RECORD.)

SIR,—I find under the above heading in your last week's issue the following: 'The Ruthin board of guardians have unanimously passed a resolution, pursuant to the section referred to (286 of the Public Health Act, 1875), that a representation be made to the Local Government Board, that it would conduce to the more efficient administration of the Public Health Act if the several sanitary authorities in the county of Denbigh were combined for the appointment of one medical officer of health.' As this announcement must tend naturally to mislead many as to the plain state of things, I may here mention them. Mr. Doyle attended a sanitary committee of the board on the 8th instant, whereat he handed the clerk the resolution above referred to. Upon this being read, a member of the committee suggested that, as the question was most important, it would be advisable to have it discussed before a full board of guardians. Thereupon Mr. Doyle informed the committee that the Local Government Board would insist upon the measure being adopted, and that any opposition would be futile. In the face of this, the committee considered it useless to discuss the question. The scheme proposed by Mr. Doyle is considered by those who know the district to be perfectly impracticable.

SANITARIAN.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

DIXON, John, Esq. (the Mayor), has been appointed Chairman of the Morpeth Urban Sanitary Authority, vice Wilkinson.

DRYSDALE, Dr. A., has been appointed Certifying Factory Surgeon for Dunfermline, vice Douglas resigned.

HASLAM, Mr. George, has been appointed Surveyor, Collector and Inspector of Nuisances for the Ilkeston Urban Sanitary District, vice Attenborough, whose appointment has expired: 120*l.* per annum.

MEATS, M. William, has been appointed Surveyor and Inspector of Nuisances for the Balsall Heath Urban Sanitary District.

PARSONS, Henry Franklin, M.D. Univ. Lond., M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Goole Urban Sanitary District for one month pending further arrangements.

ROBERTS, Mr. Roberts, has been appointed Inspector of Nuisances for the Denbigh Urban Sanitary District, vice Davies, resigned.

ROW. Mr. William, has been appointed Surveyor to the Morpeth Corporation and Urban Sanitary Authority: 100*l.* for one year.

SAER, David Protheroe, L.R.C.P. Edin., L.R.C.S. Edin., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Pembroke Urban, and Milford Port, Sanitary Districts.

STOLLARD, Mr. James, has been appointed Clerk to the Clay Lane Urban Sanitary Authority.

VACANCIES.

CLAY LANE URBAN SANITARY AUTHORITY. Collector.

GREAT HARWOOD URBAN SANITARY DISTRICT. Medical Officer of Health.

NETHERTHONG URBAN SANITARY DISTRICT. Inspector of Nuisances.

NORTHWICH URBAN SANITARY DISTRICT. Surveyor and Inspector of Nuisances. Applications, 30th instant, to James Cowley, Clerk to the Authority.

NUNEATON URBAN SANITARY DISTRICT. Inspector of Nuisances.

OSSETT-CUM-GAWTHORPE URBAN SANITARY DISTRICT. Medical Officer of Health.

SANITARY PATENTS.

3644. Improvements in machinery for the manufacture of lozenges, medals, and other like articles of confectionery, which improvements may also be applied to machinery for the manufacture of biscuits. William Crosby, Ashton, near Birmingham.

3646. An improved method of and machinery for making lead traps. William Robert Lake, Southampton Buildings, London.—A communication from Frederick Nelson Du Bois, New York, U.S.

3668. Improvements in the treatment of sewage deposits or precipitates of sewage sludge, in order to obtain therefrom ammonia, illuminating gas, and other useful products. John William Slater, Tamworth Terrace, London.

3671. Improvements in filters. Benjamin Hardwick Foster, Newcastle-on-Tyne.

ABSTRACTS OF SPECIFICATIONS.

1183. Funeral carriage or hearse. S. Dottridge, junr., City Road.

The object of this invention is to so construct a vehicle for the conveyance of the dead as to combine with solemn grandeur, elegance, and lightness of construction, certain sanitary advantages.

1210. Stoves. A. G. Southby, Abingdon Street, Westminster.

The inventor burns the gas in a chimney of a shape to suit the shape of the flame or flames. He admits air freely at the bottom of the chimney for the combustion of the gas, and supports the bottom of the pot or utensil to be boiled or heated over the top of the chimney so as to allow only a space of less than one-quarter of an inch between it and the top of the chimney; burning only so much gas in the chimney, the products of the perfect combustion of which can escape through such space; making the chimney tall enough for the flames not to reach to the top of it.

1216. Treating fæcal matters. W. E. Newton, Chancery Lane.

The fæcal matters are first subjected (under great heat) to distillation, and thus are separated into their solid and gaseous or volatile parts. Whilst the solid matters remain behind in the retort the volatile or gaseous parts pass through a tube into a vessel in which the tar is deposited, and from thence they pass into other parts of the apparatus, and are at last converted into illuminating gas.

OPEN CONTRACTS FOR SANITARY WORK.

The Board of Guardians of the Hemel Hempstead Union desire to receive tenders for works in connection with the water-supply of the village of Flamstead, Herts, comprising sinking a well, providing pumps with horse gear, constructing tanks with service-pipes, building shed and boundary walls, according to plans and specification, which may be seen at the offices of their surveyors, Messrs. Smith and Robinson, Marlowes, Hemel Hempstead, Herts.—Tenders are to be sent in not later than 10 o'clock A.M. on Tuesday, December 7, 1875, addressed to C. E. Grover, Clerk to the Authority.

The Worthing Local Board of Health invite tenders for a steam-engine of ninety horse-power, indicated : two boilers of forty-five horse-power each ; two pumps, and all necessary appliances for raising 30,000 gallons of water 200 feet vertical per hour. Drawings and specifications may be seen, and further information obtained, at the office of Mr. Lund, the surveyor to the local board, in the Town Hall, Worthing, on and after Tuesday next. Sealed tenders to be delivered, by 2 o'clock in the afternoon of Saturday, December 4, endorsed 'Tender for Waterworks,' to W. Verrall, Clerk to the Board.

The Middlesborough Urban Sanitary Authority are prepared to receive tenders for the following main drainage works, viz. :—Contract No. 5, consisting of about 938 lineal yards of brick sewer, six feet in diameter, and about 631 lineal yards of four feet six inches by three feet egg-shaped brick sewer.—Drawings, specifications, etc., may be seen, and bills of quantities, and all other particulars, obtained at the offices of the borough surveyor (Mr. E. D. Latham, C E.), Lower Commercial Street. Sealed tenders (endorsed outside 'Tender for Main Drainage Works') to be sent to John T. Belk, Town Clerk, not later than noon on December 4, 1875.

The Ware Union Rural Sanitary Authority is prepared to receive tenders for the execution of certain sewerage works, comprising the excavation for, and laying of, 1,400 yards, or thereabouts, of 15-inch, 12-inch, and 9-inch stoneware pipe sewers, with the necessary man-holes and lamp-holes ; also the construction of storage tanks, engine-house, pumping machinery, and rising main, for dealing with the sewage of Stanstead Abbots, Herts. Specification and drawings may be seen at the office of Mr. Thos. Wilson Grindle, civil engineer, 205 Gresham House, Old Broad Street, London, E.C., on and after Thursday, the 18th instant. Sealed tenders, endorsed 'Stanstead Abbots Sewerage,' to be delivered at the offices of George Gisby, clerk, on or before Monday, December 6 next.

Clayton Waterworks.—Contract No. 3.—The Local Board for the district of Clayton, near Bradford, Yorkshire, are prepared to receive tenders for the laying of about 10,000 lineal yards of cast-iron pipes, in the township of Clayton, varying from seven inches to three inches in diameter, including construction of meter-house and fixing of hydrants and valves. Plans and specifications may be seen, and forms of tender obtained, at the offices of Mr. James Lumley, civil engineer, 14 Kirkgate, Bradford, from Monday, November 22, to Saturday, November 27. Sealed tenders, endorsed 'Tender for Pipe Laying,' to be sent in to Benjamin Ashton, clerk, on Tuesday, November 30, 1875.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer—not necessarily for publication.

VALUE OF CITY PROPERTY.

THE lease of the site, with the houses 65 and 67 Ludgate Hill, has just been sold. The price paid, added to the capitalised ground-rent, represents 1,316*l.* per foot frontage for the freehold.

THE NEW CHIMNEY SWEEPERS' ACT.

By 38 and 39 Vict., cap. 70, all chimney sweepers after January 1, 1876, must obtain a certificate from the police to enable them to carry on their business. This certificate has to be renewed every year.

HORSES AND FIRES.

A WRITER in the *Daily News* says that it is not, unfortunately, generally known that in the case of fire in buildings containing horses, 'if the harness be merely put on (however roughly) the horses will quit their stables without difficulty. The insertion of this note in your widely spread journal may be the means of saving many a valuable animal, and keep the poor creature from so horrible a death.'

NEW SAFETY LAMP.

AN improvement in safety-lamps has been devised by M. Boullenot, of Paris. It consists in replacing the safety-lamps usually employed in mines containing fire-damp by lamps supplied with air from outside the mine. Fixed pipes are carried down the mine, and branches are led into all the workings. Through these compressed air is forced from the surface by air-pumps, and the improved lamps are screwed to the air-pipes by couplings with stop-cocks. The cylinder inclosing the flame is protected by a cage, and the products of combustion pass off through two pieces of wire-gauze. The match for lighting the lamp is inserted through a spring clip, ignited within the lamp, and cannot be withdrawn until extinguished.

UPPINGHAM SCHOOL.

WE are requested by Mr. Haviland, who is investigating the recent outbreak of enteric fever at the Uppingham School, to say that he will be much assisted in his inquiries if the medical attendants upon boys who have fallen ill after leaving that school, will kindly favour him with notes of the facts of illness, and particularly of the dates of commencement of illness. Letters should be addressed to him at Northampton.

M. THIERS ON PRISON REFORM.

A LETTER has been addressed by M. Thiers to Mr. William Tallack, secretary of the Howard Association, which, alluding to the efforts now being made for the improvement of prison discipline, continues : 'I offer you my best wishes for your wise and humane work, in which all civilised nations have an interest. To punish men so as to reform them is the best of social labours, and the one the success of which is the most to be desired.'

HEALTH AND SEWAGE OF TOWNS.

THE council of the Society of Arts have resolved to appoint a standing committee for the purpose of collecting facts and holding a conference yearly, at which the experience gained and the progress made in the past year will be reported and discussed, such conferences to be continued as long as necessary.

Corporations and local boards of health are invited to communicate with the secretary, and forward to him any suggestions they may think proper.

NEW MODE OF ENFORCING PAYMENT OF SCHOOL FEES.

THE *Metropolitan* says that the masters of a board school at Tipton have adopted a novel plan of enforcing payment of school fees. Three children have been 'severely flogged by the masters of the schools which they attended, owing to their having neglected to take their school pence with them.' It seems also that at one school there is a regular flogging hour, at which non-paying children are whipped. The School Board are not, however, horrified at the occurrence, and have not prohibited the practice, but only express their dissatisfaction at 'undue' flogging.

DEEP WELLS.

SOME curious facts regarding the sympathy between the existing public wells of Liverpool are given in a report recently published by Mr. Deacon, in September, 1866, an additional well having been sunk at Bootle, the yield of that station was increased from 621,660 to 1,462,000 gallons per day, but in consequence of this increase, the level of the water in Green Lane well, three and a half miles distant, fell four feet, while the former rate of yield, viz., 2,956,000 gallons per day, could not be quite maintained. In October, 1870, Dudlow Lane well was bored 142 feet deeper, and the yield was thereby increased from 771,500 to 1,415,000 in the following year, but in drawing this water the depth in the well fell two feet three inches below its former level, and the yield of Green Lane, two miles distant, was at the same time reduced from 3,741,000 (to which it had been raised by a new well and additional bore hole sunk in 1868-9) to 3,580,000, the level of the water in the well being the same in both cases. In February, 1872, on the recommendation of the medical officer of health, the pumping at Dudlow Lane ceased. The yield was thus reduced from 1,415,000 to nil. After six months' time the yield from Green Lane had increased from 3,580,000 to 3,667,000, the level of the water in the well being the same in each case. In May, 1873, the pumping at Dudlow Lane was resumed, but with the water standing in the well thirty-one feet three inches higher than formerly, and the yield proved to be only 1,183,857. From the same level in Green Lane well at which 3,580,000 gallons were drawn prior to the stoppage of Dudlow Lane and 3,667,000 during the stoppage, only 3,578,000 could be drawn at the beginning of 1875, when the pumping at Dudlow Lane had been resumed for some time. Thus the water capable of being obtained at Green Lane was less at the beginning of this year than in 1872, although the Dudlow Lane water was pumped from a level thirty-one feet three inches higher than formerly, and a smaller yield obtained. This fact constitutes further evidence in support of the statement in the engineer's report of July, 1874, with reference to the diminishing yield of the wells, and indicates that influences beyond the increased pumping at other public wells are at work to produce a constant diminution of the yield of any well, when the water is maintained at a given level.

EARTH TO EARTH.—The superiority of the London Necropolis (Woking Cemetery) has been specially recognised in the *Times*, and other leading journals, and it is admitted that here only can the burial of the dead be properly carried out. The Company is prepared to conduct Funerals without the intervention of the ordinary undertaker at any stage of the proceedings. Prospectus free.—Office, 2 Lancaster Place, Strand, W.C.

NOTICE.

THE SANITARY RECORD *is published every Saturday morning, and may be ordered direct from the Publishers. Annual Subscription, 17s. 4d. ; free by post, 19s. 6d.*

Reading Covers to hold 12 numbers of THE SANITARY RECORD *have been prepared, and may be had direct from the Publishers or through any Bookseller, price 3s. each.*

Original Papers.

ON THE VARIATIONS IN THE COMPOSITION OF RIVER WATERS.

BY J. ALFRED WANKLYN.

I HAVE recently had an opportunity of making analyses of the water of the Nile, and have noticed a a very interesting feature in that river.

The Nile is pre-eminently subject to flood, the rising of the Nile being, indeed, the chief event of the year in Egypt. Towards the end of May the Nile begins to rise, the increase in size being at first exceedingly gradual. In June the rise is just perceptible, and the river goes on increasing in volume until about the middle of September, in which month it usually attains its greatest size. Afterwards it sinks very gradually, and about Christmas it is low. From Christmas till towards the end of May the Nile remains pretty nearly stationary in size.

The cause of the rise of the river is said to be heavy rains in the months of April and May, the effect of this rainfall requiring the lapse of a considerable time in order to exert its full influence. Possibly, too, the melting of snow on mountains near the sources of the river may concur in flooding the river.

The height to which the Nile rises, as well as the exact period of the rise, varies from year to year, but it may be stated broadly that from the end of May until Christmas the Nile is more or less in flood, and from Christmas to the end of May the Nile is low. The following is a tabular statement of the composition of the water in different months :—

WATER OF THE NILE.

Date of sample.	Grains per gallon. Solids.	Chlorine.	Hardness.
1874 June 8	15·0	1·8	7·0
July 19	13·0	0·9	6·0
Aug. 12	12·0	0·3	8·5
Sept. 20	10·0	0·4	8·0
Oct. 12	11·0	0·4	7·5
Nov. 12	12·0	0·5	8·0
Dec. 12	9·0	0·45	6·5
1875 April	16·0	1·0	8·0
May 13	22·0	1·2	10·0

The remarkable point brought out in this table is the great relative alteration in the proportion of chlorine, that whereas in the beginning of June, just at the beginning of the rise of the Nile, the chlorine amounts to 1·8 grains per gallon; the chlorine sinks to 0·3 grains per gallon when the Nile has attained a great size, and remains at very little above that proportion until the end of the year.

As will be perceived, this diminution of the chlorine is proportionately very enormous, the ratio being 6 : 1. In order to be quite sure of the facts, I repeated the determination of the chlorine in the month of August, and took the precaution to evaporate down a quantity of the water to about a fifth of its volume before using the standard solution of silver. In this experiment I obtained 0·23 grain of chlorine per gallon of water. I also verified the figure 1·8 for June.

The extent of the fall in the chlorine is, therefore, quite as great as represented in the table. In marked contrast with the variableness of the chlorine, the table exhibits the comparative constancy of the hardness. On reflecting on the conditions under which the river is placed, the variableness of the chlorine and the constancy of the hardness become intelligible.

The water which swells the Nile in the latter half of the year is storm-water, being thick and muddy (as is well illustrated by the sample of Nile water exhibited in Sanitary Exhibition). Storm-water sweeps over the surface of the country, without penetrating far below the surface, and we may very readily understand that such water, passing over a country long ago denuded of salt, should carry little or no salt into the Nile, which it dilutes, and so causes to contain only an exceedingly minute proportion of chlorine.

By about Christmas the storm-water has ceased flowing into the Nile, which, during the spring half-year, must be fed with water which has passed deeper into the ground, and which has undergone concentration by evaporation, in addition to having washed extensive strata, from which, doubtless, it extracts chlorine. We can easily understand how the Nile should become more chlorinous as the spring advances, and how the chlorine should be at the maximum just at the beginning of flood-time.

The hardness, on the other hand, being due mainly to carbonate of lime, we can understand that, from the slightness of its solubility, the carbonate of lime, and consequently the hardness, should be under totally different conditions from the chlorine.

No doubt the *débris* carried mechanically down with the flood-water contains abundance of finely divided carbonate of lime, so that the storm-water must always be saturated with carbonate of lime. When in flood, the Nile is, therefore, as hard as when it is not in flood, and the comparatively slight variation in hardness at different times will depend upon the varying amount of carbonic acid present in the river.

Although in the Nile the phenomena to which I have just directed attention are exhibited in a very marked manner, yet such phenomena are not confined to the Nile. If the investigation were made, I have no doubt that other rivers—the Danube, the Rhine, and even the Thames * for example—would be found to exhibit something of an analogous character, only in a far less degree : and when they are suddenly flooded these rivers should be less charged with chlorine than at other times. The importance of recognising the different causes to which fluctuation of chlorine in drinking-water is due will be obvious when it is considered how great a stress is laid upon the presence of chlorine as an index to sewage-contamination.

The Nile as Drinking-Water.

Reverting to the Nile, I may append some determinations of the amount of organic matter in it at different times, premising, however, that my analyses were of necessity made on water which had been kept for a considerable period of time. The results are the following :—

Date when the sample was taken from the Nile.	Parts per million. Ammonia. Free.	Albuminoid.
June 8, 1874	·01	·10
July 10, ,,	·04	·25
July 18, 1875	·36	·28

* Since the above was written this anticipation has been verified for Thames' water, which, during the recent floods, has been found to be quite appreciably less chlorinous than usual.—J. A. W.

The water of the Nile is, therefore, sometimes quite as much charged with organic matter as the Thames at Hampton Court, where the London Water Companies draw the water. But, like Thames' water, it is, no doubt, amenable to wholesale filtration, and a Nile water company ought to deliver excellent water.

As will be observed on turning to the tabular statement above given, the water of the Nile is only about half as hard as the London Thames water. I have also to add that it is not charged to any serious extent with either magnesia or sulphates.

MODERN RESEARCHES ON ALCOHOL.

BY BATHURST WOODMAN, M.D.

III.

THE publication of MM. Lallemand, Perrin, and Duroy's book, *Du Rôle de l'Alcool et des Anæsthésiques, etc.*, (Paris, 1860) marks an epoch in the scientific study of alcohol. As some of their conclusions were eagerly seized upon and represented not always correctly, by the advocates of total abstinence, and their experiments were sometimes publicly performed by lecturers against alcoholic drinks, it is perhaps not surprising that those who hold opposite views should regard the book with but slight favour. I am, however, at a loss to know why the late Dr. Anstie, who was in the main a fair controversialist, should have been so strongly biassed against these French experimenters. The strong language in which he condemned this book led me to reperuse it, rather than take my quotations or extracts secondhand, no matter how excellent the abstracts given in English medical journals might be. The result has been to increase my admiration for the authors and their work. I do not hesitate to say that the book is a model of what a scientific book should be. It is clear, as most French books are, but not diffuse. It is modest and unassuming, and the greater part of the work is of that solid kind which is as good now as on the first day it was done. It is in French what Dr. Percy's book is in English. Let it be clearly understood what its authors did, and what they undertook. They availed themselves of a colour-test, a method of investigation now far more common than it was then. But they did not confine themselves to this test. They used other tests; and, like Dr. Percy, recovered by distillation a portion of the alcohol ingested. I was surprised to find how careful they had been in this matter of distilling. They took the very precautions which Dr. Anstie represented them as forgetting to take. They were equally careful in the matter of conclusions; and although the language of the summary (which shall presently be quoted) is brief, their tone was so far from being dogmatic—as Dr. Anstie represented it to be—that they expressly disclaim any finality in the experiments, and simply state the conclusions which they could not help drawing from them. The colour-test employed—in other words, the test-fluid—was a solution of a decigramme of potassium dichromate in thirty grammes of sulphuric acid; in other words, one of the chromate in 300 of the acid. Such a solution becomes of a green colour when treated with reducing agents, the chromium being reduced to a sesquioxide. Alcohol, ether, and sugar, all give the same reaction, with more or less rapidity. Here, again, I must pause to remark, that the French experimenters never once considered this as an absolute test for alcohol. But they took a man, or some other animal; found that, before taking alcohol, his breath, perspiration, or urine, did not thus reduce the chromate, and that, after alcohol was ingested, these excretions did do so, and that very rapidly. And as they also recovered alcohol by distillation, they were, I think, justified in their conclusions. It has been objected that they did not recover all, nor nearly all the alcohol; but the objectors forget that the experimenters never professed to do so.

Their work begins by stating some of the views then current as to alcohol. Thus Liebig considered it as a respiratory food, replacing starch and sugar (p. 244 of the French translation of Liebig's *Nouvelles Lettres sur la Chimie*, Gerhardt, 1852), and Bouchardat and Sandras, who supported this view, state that in distilling blood with sulphuric acid, after the ingestion of alcohol, they obtained acetic acid. (*Annales de Chimie et de Physique*, 1847, tom. xxi. p. 542); whilst M. Duchekobtained aldehyde (*Prager Vierteljahrschrift für die Practische Heilkunde*, 1853). Mialhé again, in 1856, stated that 'L'alcool est entièrement brûlé; c'est pourquoi on n'en trouve jamais trace dans les urines,'—'The whole of the alcohol is burnt up; this is why we never find any trace of it in the urine.' (*Chimie appliquée à la Physiologie et à la Thérapeutique.*) Liebig states (*loc. cit.* passage commencing 'Il est généralement admis, etc.') 'It is generally allowed that the alcohol which finds access to the blood by the various channels of absorption, is there (*i. e.*, in the blood) exposed to the action of the oxygen which is inspired. This oxidation, which takes place in the circulating fluid itself ('au sein de la circulation') causes the alcohol to undergo a whole series of transformations, of which the last term consists of carbonic acid and water, with intermediate terms represented by less oxidised compounds. A most minute fraction may escape this action, and be exhaled by the lungs. Thus alcohol will serve as food, and assist in nutrition.' This was the state of the alcohol question when MM. Perrin, Lallemand, and Duroy began their observations. They first made a number of experiments on absorption, and endeavoured to fix the fatal dose of alcohol for dogs. They state this to be from a minimum of 130 grammes (about four ounces) to a maximum of 300 grammes (nearly nine and a half ounces) of spirit of 16° to 21° Cartier, which is rather weaker than good brandy.* Fatal doses first increased the pulse, then decreased it; so that it ranged from 215 to 42 in dogs: and the respirations, which became chiefly diaphragmatic, varied from 60 to 5 per minute. They confirmed Orfila, that the heart dies last. Like Percy, they noted the anæsthetic effects of alcohol. These appear to have been long known to bonesetters, and in old times it is said that amputations were often done when sailors or soldiers were dead drunk. M. Bouisson (*Traité théorique et pratique de la Méthode anesthésique*, p. 469), states that a woman

* Cartier's hydrometers, or areomètres, though far from accurate, are still much used in France. It is difficult to compare them with degrees of specific gravity; but it may be said (generally) that 10° Cartier equal 1, or 1,000, the specific gravity of distilled water at 60° Fahr.; 20° to 23° C. equal brandy; 34° C., and above, rectified spirit; and 44° C. equal anhydrous alcohol.

was delivered, dead drunk, at the Hôtel-Dieu Hospital of Amiens.

MM. Perin, Lallemand, and Duroy state that the blood in animals poisoned with alcohol is rich in fatty materials, so much so as sometimes to be milky-looking to the naked eye. This has also been noticed in *post mortem* examinations of drunkards. *Cholesterine* is one of the fatty matters thus found in excess.

They admit that some acetic acid is produced in the digestion of alcohol; but they state that the solids and fluids of alcoholised animals contain neither aldehyde, nor acetic, nor oxalic acid. Their experiments led them to conclude that a large part of the alcohol ingested passed off by the lungs, kidneys, and skin. After six hours there was but slight colour-change from the cutaneous transpiration, whilst from the lungs there were still traces after eight hours, and from the kidneys after fourteen hours.* This was after 100 to 120 grammes of *eau de vie* had been taken (3 ounces to 3¾ ounces nearly). In one experiment, a man took three bottles of Burgundy (with ten or twelve per cent. alcohol), and about 4 ounces of brandy. He passed three litres of urine, equal to 5¼ pints. This was thrice distilled, the first distillate being about 6 ounces, the second about 1 ounce, the third about one drachm, which was nearly pure alcohol.

From 700 grammes, about 25 ounces, of blood, after ingestion of alcohol, about five grammes, or a little more than one drachm of not very concentrated alcohol was obtained.

The conclusions they drew from their experiments on the toxic action of alcohol are:

1. That alcohol is chiefly absorbed by the veins, and taken into the blood.

2. It produces intoxication in other animals besides man.

3. Respiration and circulation are increased, or rendered more active; and temperature is increased at first. Afterwards respiration, circulation, and temperature are all diminished or lowered.

4. Muscular power is greatly enfeebled.

5. Insensibility is produced; this begins at the periphery, and goes towards the centres.

6. The heart dies last.†

7. In fatal cases, from five minutes to three hours is the interval between intoxication and death. [With maximum doses, life is, however, prolonged even beyond this in some other animals, as well as in man.]

8. It takes from fifteen to twenty-four hours to recover from toxic doses.

9. Fatty changes are induced in the blood.

10. The chief morbid appearances are to be looked for in the stomach, the right heart, and the venous system.

11. All the solids and liquids of the body (in poisoning by alcohol) will be found to contain alcohol after death. [Thus confirming Percy.]

12. The largest quantities will be found in the brain, liver, and blood. They give the following as the relative proportions of alcohol found in the blood and tissues in this mode of death.

	When swallowed.	When injected into the veins.
In the blood . . .	1·0	1·0
,, nervous centres .	1·34	3·0
,, liver . . .	1·48	1·75

They state that neither aldehyde nor acetic acid could be detected in the blood. But a little acetic acid was sometimes found in the stomach.

Taking all their experiments, and all that was then known of alcohol, MM. Perrin, Lallemand, and Duroy were led to these conclusions:

1. That alcohol is not a food.

2. That it acts especially as a moderator on the nervous centres; it first excites, then stupifies.

3. It appears neither to be transformed nor destroyed in the body.

4. It accumulates in the brain and liver.

5. It is eliminated by the lungs, skin, and kidneys.

6. The pathological changes are chiefly in the blood, nervous centres, liver, and kidneys.

7. The effects of stimulant beverages are chiefly due to alcohol. The moderate use of such as wines and beer is not injurious. But spirits, except for special reasons, should be eschewed.

The alcohol question has made such progress since 1860 that most of my readers will have already anticipated the remark that some of these conclusions are not justified by the present state of our knowledge; and the experimenters would probably modify them somewhat had they now to republish their work. But this applies chiefly to nos. 1 and 3 of the last list above. If we make all necessary deductions and corrections in conformity to the present state of science, the work of these three French collaborateurs still remains as a good example of honest, ingenious, and painstaking nineteenth century work on a difficult question. I have said ingenious, for they contrived apparatus to demonstrate the giving-off of alcohol in the breath, and from the skin; and to demonstrate it in the urine, which they distilled, and that carefully, though Dr. Anstie implies otherwise. They also varied their experiments, and took a great deal of trouble, first, in devising the trials and tests; and next, in condensing the account, and excluding extraneous matters in a manner quite unusual in scientific brochures, and especially in continental ones. In our next paper we shall try to show how far the experiments of others corroborate these experiments on elimination.

* The present writer found that even small quantities of alcohol ingested, continued to give evidences of their presence on the second or third day after ingestion. See 'On Elimination of Alcohol, etc.,' by W. B. Woodman. (*Medical Mirror*, February, 1866.)

† *Ultimum moriens* of Nysten and Galen.

THE HYGIENE OF DRESS.

II.

Principles of Clothing.

THIS subject has occupied the attention of a great many writers on hygiene, but none have placed the matter in a clearer light than Dr. Morache, who has collected all the scattered facts of the subject in his exhaustive treatise *De l' Hygiène Militaire*; and, with his assistance, we shall endeavour to convey a comprehensive idea of the true principles of clothing with regard to the requirements of hygiene.

The practical study of clothing comprises two categories—first, the determination of the primary substance to be selected as clothing material, with reference to the physical properties of these substances; secondly, the form or shape to be given to these materials to transform them into garments, and the use of each of them in the different conditions of life.

The materials of clothing supplied by animals and plants may be considered, first, as to their relation to caloric—according as they present a power of absorption or a power of emission; secondly, as to their relation with water, according as they are more or less hygrometric; thirdly, as to their relation to electricity, according as they are idio-electric or an-electric.

1. *As to the Relation of Clothing to Caloric.*—In their relation to caloric, garments are designed to protect the body against the depressions or elevations of temperature, sometimes very considerable in certain climates and in certain seasons, to prevent it from absorbing by its exterior surface too great a quantity of caloric, or, on the contrary, rapidly to emit a large proportion of it. Thus, clothing materials play the part of a screen, interposed between the body and the exterior—a screen, the power of which will vary according to their emissive or absorbing properties, and also according to their texture.

Experiments have demonstrated that woollen materials possess the least emissive property, that is, they present the greatest opposition to the diminution of temperature. According to Hammond (*Treatise on Hygiene*, etc.), the following are the emissive powers of various clothing materials, as to the duration of their refrigeration from 150° to 140° Fahr.

Cotton stuff for shirts . . .	15′ 11″
Linen ,, ,, . . .	9′ 42″
Flannel (white)	12′ 35″
Cloth (dark blue)	14′ 5″
,, (light blue)	13′ 50″

The absorbing power of the same stuffs have been determined by analogous experiments, that is, by plunging a thermometer into a glass tube containing heated water, and covered with the various materials.

Cotton stuff for shirts . . .	35·1°
Hemp (unbleached)	39·6°
Cloth (dark blue)	42·0°
,, (iron grey) for overcoats . .	52·5°

It is evident, according to these experiments, that white cotton stuffs are very efficacious protectors against heating produced by the solar rays; their effect is a temperature 7·9° below that experienced under a garment of dark blue cloth, and 7° below that under a garment of iron grey.

The result is that, by superposing close-woven cotton stuff upon a cloth garment, we obtain a difference of at least 7°. 'It is not too much to say,' observes Professor Coulier, 'that in Algeria, during the great heats, the difference would have been from ten to twelve degrees, since the difference increases with the temperature.'

It is thus very evident that, on the one hand, wool is endowed with a much less emissive power than cotton or linen—which constitutes it a bad conductor of heat; and, on the other hand, that it is enabled to absorb the calorific solar rays much faster than linen or cotton; but this power of absorption and emission varies essentially in the same stuff, with the colour of which it is dyed.

Count Rumford in 1792, Franklin, Humphrey Davy in 1799, and Stark, of Edinburgh, investigated the absorbing power of the different colours, which may be arranged according to the intensity of this power in the following order—black, dark blue, light blue, green, purple, red, yellow, white.

According to Coulier and Professor Bache (*Journal of the Franklin Institute*, November, 1853), the differences of temperature are not truly appreciable excepting when the stuffs are directly exposed to the solar rays; in the shade, the thermometric variations are almost null, whatever may be the heat.

From these facts we may draw the conclusion that, in our climate, in which we are more exposed to suffer from cold than from heat, and in which we court rather than shun the calorific influence of the solar rays, our garment should be of wool—in order to oppose as much as possible the loss of heat by means of radiation; and that the colour should be very dark—black, blue, or grey—in order to permit the heating of the body by the solar rays *when we can be exposed to them.*

2. *Hygrometric Properties of Clothing Materials.*—Our garments should play the part of a screen betwixt the body and the external air relatively to heat; it should play the same part in relation to the vapour of water, the presence of which is a source of refrigeration. If the body, heated and covered with abundant perspiration, is not protected against the too rapid evaporation of this secretion, a dangerous refrigeration is the result; on the other hand, if the external air is saturated with humidity, and the garment is placed in contact with that humidity, it will tend to place itself in an equilibrium of temperature with the external air—whence another source of refrigeration. More than any other tissue, wool is adapted to moderate this acquisition of equilibrium of temperature by means of the property it possesses in regard to water, namely, of considerable absorption; wool, in fact, absorbs more hygrometric water than any other material; with equal weight its power of absorption is double that of cotton; with equal surface in cloth this power is, according to Dr. Morache, about quadruple.

From an elaborate table furnished by Coulier, it is evident that cotton is, of all stuffs, the least endowed with the power of absorption; linen comes next; its power of absorption being intermediate between that of cotton and wool, it naturally follows that if the body, in a state of perspiration, is separated from the surrounding air only by cotton or linen stuff, the latter being unable to absorb a sufficient quantity of liquid, evaporation will be rapid, especially if the air be in agitation. On the contrary, if woollen stuff be so disposed as to serve as a screen, it will absorb a great portion of the perspiration, and evaporation will be much less rapid. This hygrometric water which it absorbs, at length disappears, but slowly, and consequently without producing refrigeration. 'Therefore,' as Dr. Parkes observes, 'woollen covering, from this cause alone, at once feels warm when used during sweating. In the case of cotton and linen the perspiration passes through them, and evaporates from the external surface without condensation; the loss of heat then continues. These facts make it plain why dry woollen clothes are so useful after exertion.'

3. *Electrical Properties of Clothing Materials.*—Certain substances possess the property of developing and retaining the electric fluid—of being idio-electric, that is electric in themselves, or containing electricity in its natural state—such as wool, furs, and silk; hemp, linen, and cotton, on the contrary, are anelectric, that is, good conductors of electricity, on account of their great hygroscopic endowment. Now, the human skin being adapted for electrisation, the friction on the surface of idioelectric tissues may give rise to a disengagement of electricity. This phenomenon is favoured by the superposition

of garments and their agitation or friction in the acts of locomotion. Two stuffs, or two portions of the same stuff, rubbed one against the other, may contract very decided electric states of opposite character. Whether the electric fluids thus developed are distributed over the circumference of the body, giving it a certain degree of tension, or whether they react by becoming recomposed, they exert an influence which is small, but still real, and which forms part of the merits or demerits of woollen garments or furs, manifested by circumscribed and repeated stimulations to the vascular and nervous elements of the skin.

It must never be forgotten that the principal source of our heat is internal, and depends upon the vital action of the economy. As Dr. Halton observes, in his admirable lectures on 'Sanitary Subjects,' this is proved by the fact that cold succeeds death, even in an atmosphere that is warm to the living. Debility, also, from whatever cause, produces cold, the extremes of life being very susceptible. A newborn baby will die from slight exposure, and the chilliness of old age is proverbial.

The same writer remarks that 'with regard to colour, it may be said that black is the best colour for winter, and white the colour suitable for summer, the former resisting the sun's rays much less than the latter.' But this is a misapprehension of Franklin's experiment with pieces of wool of different colours placed on snow. Certainly, dark colours will absorb heat which is external and transmit it; but in winter, when *cold* is external, it is evident that light colours, which transmit heat the least are preferable, by not favouring so much the escape of internal heat. In fact, white garments are, according to the strict logic of facts, the best adapted for both winter and summer; in summer and in hot countries they protect us from the heat, and in winter and cold countries they preserve the natural heat of the body. The colour of the coat given to the Polar bear is proof positive of this conclusion, and the universal experience of mankind attests the advantage of white in summer.

THE
SANITARY RECORD.
SATURDAY, DECEMBER 4, 1875.

The Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers read before the members of any sanitary or kindred association.

ON THE BETTER CONSTRUCTION OF DWELLING-HOUSES.

As much attention is now being paid to the better construction of ordinary dwelling-houses, and as it is very probable that the Metropolitan Board of Works will again introduce a bill into Parliament to amend the Act of 1855, it may be useful to consider very briefly some of the most prominent sanitary defects of the houses which are built for middle and lower-class occupation. We do not say that the dwellings erected for the wealthy classes are always models of sanitary perfection, but certainly at present they are better planned, as well as better drained, warmed, and ventilated than they were even thirty years ago.

Some 'suggestions' on this subject were made a short time since by the late Dr. Ross, medical officer of health for the St. Giles's district, which may serve as a basis for our remarks. As is well known to those who had the pleasure of working with the late Dr. Ross, we have lost in him an able, zealous, and practical sanitarian, who had devoted much time to the consideration of these matters. His first suggestions were, that before the buildings are begun the subsoil of the house should be properly drained; if of clay, it should be burnt and a layer laid down to improve the drainage; also, that the entire site of every dwelling-house should be covered with an impermeable material. The first two suggestions appear to be of questionable value, for if the soil under the house alone be drained, and the ground thereby rendered drier than before, any moisture in the soil external to the area of the house would find its way under the house, and drainage from imperfect drains on adjacent houses, if such existed, would take the place of ordinary land drainage. If the ground were rendered more porous by the layer of burnt clay, the mischief might be made worse by the escape of injurious gases through the loose soil. The chance of this occurring would be much increased by the proposal to carry all the house drainage along the rear of the houses, instead of, as now, under the basements or parallel with the foundation walls into a sewer in front. We consider that if concrete, or other impermeable material, be laid down over the whole site of the house, the less the subsoil is interfered with the better, as recent researches have shown that on a loose subsoil a greater proportion of deaths occurred from cholera than on a clay foundation. The proposal to lay down concrete is one with which we entirely agree, but it is not new, as in the sixth schedule of the Metropolitan Buildings Bill, which was introduced into the House of Commons by the Metropolitan Board of Works in 1871, we find the following proposition: 'The ground-surface or site of every dwelling-house, where not flagged over, shall be covered with good concrete, at least six inches in thickness.' It is much to be regretted that this bill did not pass, as many very great improvements in the sanitary arrangements of dwellings must have been carried out by metropolitan builders. The next proposals as to footing and walls are to be found in the same schedule of the Buildings Bill, except that Dr. Ross proposes concrete foundations in all cases, and the Metropolitan Board only when the substructure is not solid, but both agree in proposing 'a damping course' in the walls. This latter, we consider of the greatest value, as it would prevent

damp rising up the walls, no matter how damp soever the adjacent ground may be.

We have already incidentally referred to Dr. Ross's proposal to carry the house-drains into a sewer in the rear of the buildings. This we know from practical experience to be attended in many instances with most injurious results. When each house has a drain of its own connected with a sewer in front, or even two or three adjoining houses have a common outlet passing under or by the side of one of the buildings, there is no great difficulty in compelling the owners of the houses to cleanse and repair the drains when they get out of order, or are simply stopped; but when a large number communicate with a common drain in the rear, the greatest difficulty occurs in compelling the owners to take joint action for the necessary cleansing or repairs. If the sewer belonged to the local authority, compensation would have to be made to the occupiers for any damage which might be done to the premises, yards, gardens, or other places in cleansing or repairing the sewers. This objection might, perhaps, partially be met by means of access being provided to the drains when originally laid down. We have known weeks to elapse before we could obtain the clearing out of a long back drain and common outlet of this kind, when eight or ten different owners drained into it, as notices had to be served, summonses taken out, and orders obtained before they would do the work. Whereas if a drain be carried under the basement and surrounded with a thick layer of concrete, no escape of drainage-matters can possibly take place, or any injury to health occur. The drainage clauses of the Metropolis Local Management Acts, make the drainage of two or more houses by a common outlet an exception to the general rule of separate drainage, and we think very wisely so, as almost every circumstance, except expense, is in favour of separate as opposed to block drainage, provided all the necessary precautions are carried out in a proper manner. Of course drains passing under houses, without being imbedded in concrete are most objectionable.

The suggestions as regards the size and height of the rooms are such as would, if enforced, lead in many instances to their being inhabited by persons of more than one family to a far greater extent than rooms of the height and size which are now ordinarily met with in small houses. He proposed that no habitable room should be less than nine feet high, or have less than 150 feet superficial area, which would give a cubic capacity of 1,350 feet. This would render the rent of each room so high that a solitary female, or even male, person with a small income would be obliged to share it with another, and the privacy of the home be destroyed. Persons with families would often occupy one room only, instead of two, for the same reason. We, therefore, prefer the proposal in the Buildings Bill that no room, not being in the roof of the building, should be hereafter constructed less than eight feet high. As regards rooms wholly or partially in the roof of a building, we think they should be eight feet in height over one half of the area of the room, and that every habitable room should have a window at least sixteen square feet in size and a fire-place. In legislating for the poorer classes we must consider not only what is best, but what is practicable, or even advisable; and although it is of the greatest importance that a reasonable height should be given to the room, a minimum area, in our opinion, should not be fixed.

The conditions on which rooms in a basement may be inhabited, or indeed made habitable, are of great consequence, as many cellar dwellings are even now occupied. At present, any room, the ceiling of which has at least a foot of its height above the surface of the footway of the adjoining street, may be occupied, provided it has an area three feet wide in every part for its whole frontage, from six inches below the level of the floor, and a window of nine square feet in size. Dr. Ross proposed that the ceiling should be at least two-thirds of the height of the room above the top of the area wall, or surface of the adjoining footway. We think the former standard too low, and the latter unnecessarily high, so that if the ceiling of the room were four feet above the area wall and the surface of the adjoining footway, healthy rooms might be obtained, without unnecessarily increasing the expense of construction. Of course the rooms should be provided with an area along their entire frontage, carried six inches at least below the floor level, properly covered with cement or concrete and drained, and at least three feet six inches wide in every part.

It would be evidently insufficient to provide regulations as to the size and height of rooms in dwelling houses without proper provision for light and ventilation. Dr. Ross suggested that there should be an open space in the rear of 150 square feet, and never less than ten feet in width in any part. The proposals of the Metropolitan Board were, in our opinion, more comprehensive, as they not only provided for a hundred square feet at least in the rear or side of the building, and not less than ten feet at any part of the space, but that when the building is more than one storey in height above the ground or entrance storey, the distance should be increased by five feet at each additional storey up to a minimum of twenty feet. This would be sufficient for health purposes if it were also provided that no additions, after the buildings were erected, should under any circumstances be made to dwelling-houses, or as regards any rooms used for habitation in buildings which are only partly used as dwelling houses, in such a way as to diminish these open spaces. It is, however, somewhat doubtful if these regulations could be strictly carried out in the city in the houses where the majority of the rooms are used for offices, and one or two only reserved for the person having charge of the house.

Considering the number of cases of typhoid fever which have occurred amongst the better classes in consequence of water-closets imperfectly ventilated opening into dressing-rooms or corridors, the position of this necessary should be fixed by legislative enactment. Dr. Ross proposed 'that it, or other contrivance for like purpose, should always be detached from the house, or so situated that there should be space for a current of air between the house and the closet.' This, we think, unnecessary, except perhaps as regards one or more closets for use during the day. There can, however, be but little doubt that it should always be ventilated directly into the open air, and also open into a well-ventilated corridor or passage situated between it and any room. It would be too great an innovation on present arrangements to carry out Dr. Ross's plan of entire separation from the house, and it is questionable if the benefit gained would be equal to the great inconvenience which would be caused to the sick and feeble; but it seems absolutely necessary to prohibit closets being erected where they cannot be ventilated directly into the open air, or where they open directly into any room which is inhabited either by day or by night.

Dr. Ross's suggestions for block buildings are very good, and are as follows. All block buildings for the occupation of numerous families should have staircases and passages external to the walls of the house, to provide ready escape in case of fire, and to prevent the spread of disease. A suite of rooms intended for the occupation of a separate family should be entered directly from the street or staircase, and the house and rooms should be so arranged that thorough ventilation is secured. At least half the superficial area on which the building is to be placed should be left open for ventilation, and at least thirty feet in depth be left between the walls of each block or of one block of any other house, back and front. In addition to these we would suggest special arrangements for the water-closets, water-supply apparatus and dust bins.

The position of the cistern, if any, supplying the water for domestic use should be also defined. It should not be placed under the flooring of a room or passage, which it often is, but in some position of easy access for cleansing, and where it would be protected from the frost. If the water be derived from a constant supply a small cistern should be provided, so as to store sufficient water for use whilst repairs are being done on other premises supplied from the same main, and also to fill a vessel with water more rapidly than can ordinarily be done from the main. No connection with the water-closet or drain should be allowed, but the overflow-pipe should be carried through the wall so as to act as a warning pipe whenever the ball-tap ceased to act properly. There is considerable dispute as to the comparative benefits to be derived from a small or full-sized ferule for the supply to the house, but we can say from long experience that a moderate-sized ferule and a small cistern which is emptied probably more than once daily, affords a very satisfactory supply without the risk to fittings, and of consequent leakage, which occurs with the large-sized ferule adopted in accordance with the regulations which have been agreed to under the Metropolis Water Act, 1871. To those who object to drink water which has been stored in a cistern, there is no difficulty, when the supply is on the constant, in having a pipe with a screw-down tap connected with the pipe supplying the cistern, and thus drawing it off, whenever required, direct from the main.

Dr. Ross concluded with two suggestions which are of much importance. One is that in all new neighbourhoods the paving of the roads and footways should be completed before the houses are occupied. With this we emphatically agree, but with the last 'that no house should be occupied until a certificate has been given by a medical officer of health or a surveyor, that the regulations have been complied with, and that it is fit for human habitation,' we do not agree, so far at any rate as the medical officer of health is concerned, as he cannot know that the house has been properly built and drained, unless he had seen the foundations put in the drains laid, the concrete put down, and other works carried out. This duty is peculiarly the province of a surveyor, and we think that every district surveyor should be called upon, as part of his ordinary duty, to certify that the materials used, and the works carried out, were in strict accordance with the requirements of the Act of Parliament, and the by-laws of the board or other local authority.

Notes of the Week.

THE St. Marylebone Vestry have resolved to establish a mortuary in that parish.

LAST week the fatal cases of scarlet fever in London were 120, as against 98 in the previous week.

EXCAVATIONS for the proposed buildings of a new meat and general provision market at Brixton have been commenced. The business is to be conducted on the co-operative principle.

THE Greenwich District Board of Works have effected a saving of 131*l.* 2*s.* 5*d.* during the year by employing their own men and plant for carting, slopping, watering, and tar paving.

THE City Commissioners of Sewers had this week before them the report of the committee relative to their proceedings under the Artisans and Labourers' Dwellings Improvement Act, and in moving its adoption, Mr. J. T. Bedford corrected an impression which prevailed that the court intended to deal with Holiday Yard only, observing that the law would be enforced in the whole of the other twenty places respecting which the medical officer had reported. This course would involve an expenditure of 600,000*l.*

THE election of a coroner for Suffolk, which took place on the 25th ult. at Ipswich, resulted in the return of Mr. Chaston, an auctioneer. The contest was to a great extent political, and the successful candidate is a Conservative.

THE Local Government Board have assented to the proposition of the Islington Guardians that Mrs. Sustins, the matron of the workhouse, shall also be matron of the infirmary. This is the first time one person has been allowed to hold both offices.

THE Mansion-House Fund for the relief of the distress caused by the recent floods now amounts to 10,000*l.*, in addition to which about 1,000*l.* have been collected on the Stock Exchange and distributed to the indigent poor of the neighbourhood which has suffered.

A SERIES of lectures on 'Unhealthy Trades' will be delivered before the Society of Arts, by Dr. B. Richardson, who has been appointed by the council of the society to make special inquiry into the subject. These lectures will be delivered on Friday evenings, commencing on December 3.

NAUGHTY TOYS.

THE Baroness Burdett Coutts is laudably anxious to prevent predisposition to cruelty from being instilled into the minds of children. She seems, however, to carry an admirable principle to the verge of absurdity when she writes a long letter to a daily paper, which accords to it the honours of leader type; the main point of the letter being to suggest that toys should be suppressed which suggest ideas of cruelty, by 'very ugly arrangements for snipping off heads of cows and pigs, and various mechanical toys whose chief amusement and merit seem to be derived from the fact that by pressing and squeezing they make squeaks and noises suggestive of *pain*.'

FILTH FEVER.

WE see that typhoid fever of a virulent character has broken out in the village of Appleby. In one instance, a fine powerful man, aged forty-six, has succumbed to the epidemic, leaving a family of nine children. It is stated that if strict attention to sanitary laws had been paid, fever would probably not have occurred. The *Lincoln Gazette* states that in one house where the fever has been violently manifest there is only one sleeping room for a man and his wife and seven children; in another cottage two small sleeping-rooms are divided by a wooden partition, and contain a family of eleven. The state of the privies and the wells, many of them open, is literally shocking; and yet these places, it is added, are within a short distance of the residence of one of the members for North Lincolnshire.

MUD IN PEPPER.

THE unfortunate 'consumer' has an obstinate dislike to swallow more than his normal 'peck of dirt,' to which we are all supposed to be condemned, but he does not always find that support from magistrates and public analysts which he might reasonably desire. In a 'pepper' case tried on the 5th instant, at Cardiff, an analyst, by name Drane, testified that 'genuine pepper might contain 20 per cent. of sand,' without its being considered to come under the provisions of the Adulteration Act. The sand might be due, Dr. Hassall said, 'to accident, and the imperfect manner in which the berries were dried in the open air, exposed to the sun and mud.' Mr. Drane considered the sample as 'genuine pepper, but of inferior quality, and it was probably the last fraction of a bag down which the sand from the pepper in the whole bag had settled by gravitation.' If these highly injurious dicta are to prevail, the taste for ground pepper will probably decline, for it will be impossible to ensure its purity or to prevent its adulteration.

AN ORDER OF MERIT FOR COLLIERS AND IRONWORKERS.

BEARING in mind that bravery in connection with the saving of life in peril from fire or water is specifically rewarded by special agencies, the Knights of St. John of Jerusalem have turned their attention to the recognition of heroism at our collieries and ironworks. A case of the kind happened not long ago in consequence of the coming into collision of two cages in a shaft near to Chesterfield. Six colliers were in one of the cages, five of whom were preserved alive by the dauntlessness and the prolonged endurance, notwithstanding they were suffering great pain, of two noble fellows of the pit's company. In recognition of this bravery, note has been taken by the knightly order of which we speak; and a few days ago Sir Edmund Lechmere, as secretary of the brotherhood, went to the place (Whittington Moor) and presented medals and other gifts to the two heroes in humble life. In one case, with the medallion, a plot of land was given, enough whereon to build a cottage; and the employers of the miners, it is gratifying to know, have added to the gifts with which their servants were presented by the Knights of St. John.

THREATENED DESTRUCTION OF AN OPEN SPACE.

A PLEA has been put forward for the preservation of a fine open space at South Hackney, known for a great number of years to the inhabitants of that district by the name of 'Tyler's Field.' The space in question is some five or six acres in extent; it is well turfed and picturesquely ornamented by a belt of finely-grown trees. It adjoins the Well Street Common, from which it is only separated by a wooden paling. Possibly at one time it might have formed part of that Common; but that at least would have been a great many years ago. For a number of years Tyler's Field has been enclosed and utilised for grazing purposes. Yet from the fact that it has been used on numerous occasions as a playground for children, when enjoying their annual 'treats,' it has come to be considered by the inhabitants in the surrounding district that it was not to be built upon. The land forms part of the Cassland estate—property bequeathed for benevolent purposes by Sir John Cass, and it is held by the trustees of the estate. The original intention of these trustees was evidently to keep this ground open, for, notwithstanding that building land in the neighbourhood has increased in value in recent years, no attempt has hitherto been made to dispose of this space. All at once, however, preparations have been made for building on it, and these are naturally regarded by the people of the district with dismay. The whole of the land has been mapped out by a surveyor, and it will no doubt be speedily covered with bricks and mortar, unless there is timely interposition in the public interests. How far the trustees of the Sir John Cass charity are following the wishes of that benevolent individual in disposing of 'Tyler's Field' for building purposes, we cannot say. If it was the founder's intention that it should be so appropriated, it is strange that it has not long since been covered with buildings. We can scarcely conceive a better purpose to which this land could be devoted than that of ministering to the health, recreation, and enjoyment of the thousands of poor who live in crowded homes in the locality, and no doubt if Sir John Cass could, when he lived, over 150 years ago, have had the least idea of the vital necessity which would arise for retaining as an open space in the midst of a dense population a piece of land which during his lifetime stood in the open country, he would have desired its dedication to the public use. We hope that the trustees of the Cassland Estate may be able to take this view of their duties and responsibilities in respect of 'Tyler's Field,' and that they may yet prevent its appropriation for building purposes.

THE FLOWER MISSION.

THIS pleasing form of showing interest in our less fortunate brethren has taken very healthy root in the wealthy district of Paddington. The mission commenced there last April and ended on October 28. About thirty ladies took part in the work. Parcels of flowers came from all parts of England and a few from Scotland. To meet the incidental expenditure, 20*l.* 19*s.* was subscribed by some of the inhabitants of Paddington. After paying a messenger for thirty weeks, carriage amounting to 15*l.* odd, and sundry expenses, including postage and printing, there remains a balance of 1*l.* towards the fund for 1876. If railway companies would follow the example set by the Great Eastern line, and convey all parcels marked 'Flowers for Hospitals' and empties at half price, the work of the mission would in future be much facilitated.

THE SPREAD OF INFECTIOUS DISEASES.

THE Rural Sanitary Authority of Bridge Union have passed a series of resolutions which are worthy of consideration by all sanitary authorities throughout the kingdom. Reference to the letter from Dr. Robinson, and the memorial published in our correspondence columns will show the practical and sensible character of the legislative interference sought from the Local Government Board. There can be no question that if these regulations, or others of a similar character, were made compulsory, the consequent measures of isolation would conduce to a great diminution of the spread of infectious diseases. Simultaneous action of a similar character on the part of sanitary authorities throughout the kingdom is earnestly requested, and would be useful in impressing the Local Government Board with a sense of the great need and advantage of the enactments sought at their hands.

DRY-CLOSETS *versus* THE MIDDEN SYSTEM.

DR. TATHAM, medical officer of health for the borough of Salford, in his last report remarks: 'On the occasion of the recent visit to Salford of the health committee of one of our large neighbouring towns on a tour of sanitary inspection, the chairman, a medical man, closely questioned a number of the occupants of houses where the midden system had been exchanged for Morrell's new cinder-sifting dry-closet supplied by the Sanitary and Economic Manure Company (Limited), Salford, as to the effect of the change on their health, and the reply he almost invariably received was to the effect that they had experienced much greater comfort and better health since the change to the new system; and it is a matter of fact for which I am myself responsible, that whereas diarrhœa used to reign almost endemically during the autumn and summer months in some houses to which middens were attached, that disease has been seldom, if ever, heard of since the change to the new closet; whilst if any should doubt the improvement effected by the change of system in the air which the inhabitants of these houses breathe, let him pay a visit to M'Clearey Street, Pendleton, where about forty new ash-closets have replaced the middens which two years ago smelt so horribly as to render it almost impossible to approach them for the purpose of inspection.'

'THE CHEESEMONGERS' GRIEVANCE.'

THIS grievance takes the form of a desire on the part of the cheesemongers to know how, under the new Act, they may safely sell their butter and lard. According to a trade journal, which professes to be their organ, they have every desire 'that the public shall be supplied with a pure article,' and 'that nothing shall enter their shop except what is good and wholesome.' It is suggested by Mr. Webber in the interest of this important trade, and his suggestions seems to have met with pretty unanimous support by those interested, that a verbal declaration is not required, but that these harassed traders will be sufficiently protected when selling adulterated butter and lard, by affixing a label on which the word 'mixed' is printed. The solicitor to the Provision Trade Protection Society, however, happens to possess an unbiassed mind, and to take a common-sense view of the legal requirements under the Act. He points out that butter cannot be considered to be a mixed article, and that unlike the public sanction sometimes given to the addition of chicory to coffee, when the fact of the admixture is announced, butter is supposed by the purchaser to be the pure fact derived from milk, and lard to be the pure adipose matter of the pig. The legal difficulty which this gentleman anticipates as likely to occur to his clients, is that magistrates, judges, and juries, will probably consider any mixture of other fatty matters in the articles sold as butter or lard to be for the purpose of fraudulently increasing weight or bulk, or concealing an inferior quality. We believe that every person capable of judgment will agree with the solicitor to the Provision Trade Protection Society, and we commend the clearness of his opinion, as well as the candour with which he states that which is evidently, to his clients, a most unpalatable truth. There will be some difficulty, we hope, in explaining away the very important bearing of a case decided by Mr. Benson on the 25th inst. The compulsory powers of purchase vested in the inspectors, under the Adulteration Act, have always been held by some representatives of the trade to be an insult upon the general probity of the trading classes. Only a few weeks ago it was declared to be gratuitous impertinence and a foul libel to suppose for one moment that any grocer would tamper with samples purchased under the Act. It is only a collateral proposition to declare the utter impossibility of any grocer or cheesemonger attempting to substitute one article for another on the entrance of the obnoxious inspector. Yet we find the foreman of a large dealer tapping his counterman on the shoulder, and ordering him not to supply the inspector from one particular bladder of lard, which he had been about to do, not knowing who the customer was, but suggesting the supply for official inspection from another bladder of lard. Under the late much abused Act neither prosecution nor conviction would have been possible to counteract the vigilance of the foreman. He might, at any time when he suspected the samples were being purchased for analysis, prevent articles which he did not wish to be submitted to analysis from being handed over. The defence was a very epitome of all the arguments that have been adduced against the Food Adulteration Act by the trade journals from the very commencement. One thing appeared, however, to be certain, that if the foreman had not known the inspector, and if he had not suspected that the sample might have been for the purpose of analysis, he would not have prevented the shopman from selling to any casual customer the lard which he refused on this occasion. Mr. Benson required the defendants to pay a penalty of 5*l.* and costs, and this decision is one which cannot fail to have a beneficial influence on the sale of lard and butter, whether to wholesale or retail customers.

SANITARY ARRANGEMENTS AT THE NEW HOSPITAL FOR SICK CHILDREN, GREAT ORMOND STREET.

THE sanitary arrangements for this new building seem to have been very carefully considered, and a short description of them may not be without interest and utility.

In the construction of the wards abundance of window space has been thought essential for light, air, cheerfulness, and ventilation. The windows are opposite to each other, and are planned to come between the beds. In order to secure dryness and warmth, the external walls of the wards are built double, with an air-space of about one inch between the inner and outer walls. The material adopted for the inner surfaces of the wall is glazed brick. Each brick is coated, in the manufacture, with a glazed surface of pottery, hard, and quite impervious to moisture. The

walls lined with these bricks can, therefore, be washed and thoroughly cleansed at any time, and it is hoped that this mode of construction will secure immunity from pyæmia, and other evils sometimes incidental to hospitals. The glazed surfaces of the bricks are made of different colours, such as red, brown, and light green, and are disposed ornamentally, so as to give the walls a pleasing and bright appearance. The floors are of concrete, by Messrs. Dennett, supported by iron beams and joists. The construction is therefore incombustible, and forms an effectual separation of the stories. The upper surface of the floors in the wards is covered with teak two inches thick. This wood was selected as the hardest and most impervious to moisture available, and a wooden floor was considered more healthy and comfortable for the patients than any other material. The water-closets, bath-room, and ward-kitchens are floored with hard asphalte laid on the concrete, to admit of constant washing and cleansing.

The wards are warmed by means of stoves placed in the centre of the room. The stove has two faces with visible grates so as to secure the cheerfulness of an open fire. The smoke passes away by a descending flue, which is constructed in the thickness of the floor. Fresh air is admitted to the wards from the external atmosphere by a similar flue. The air passes through warming-chambers in the stove, which can be regulated so that it may enter wards in winter heated to any temperature that may be desired.

The smoke-flues from the stoves are carried into a general shaft, and are formed of iron pipes. These pipes becoming heated by the smoke, cause an upward draught in the shaft. Advantage is taken of this circumstance, and the shaft is connected by separate inlets with the ceilings of the wards, so as to draw off the vitiated air from them. In summer time, when the stoves are not in use, the up-cast draught in the shaft can be assisted if necessary by a small furnace in the basement, specially constructed for this purpose, and placed in the bottom of the shaft. Hot-water pipes are also placed at the ends of the wards, as an auxiliary means of warming them in severe weather.

The water-closets, baths, and other necessary accommodation, are placed in the angle towers of the building. Each tower is used as a ventilating shaft for these adjuncts. Openings are contrived at the tops of the pyramidal roofs, and a coil of hot-water pipes is placed in each roof, to assist the upward draught. Flues for the discharge of vitiated air communicates with the several floors beneath, which are thus entirely cut off from the rest of the building.

The drainage of the hospital is effected by glazed earthenware pipes. The drains are carried round the exterior of the building, and communicate with the main sewer by means of a specially designed iron-pipe connection. Precautions have been taken against the risk of a rush of bad air from the main sewer. The iron connecting pipe is furnished with two traps, one at each end of it. From the intervening space between the two traps there is an up-cast air-flue, which is carried up to the top of the building. If at any time there should be a draught from the sewer strong enough to force the first trap, it would be intercepted and carried off innocuously by the air-flue, and the protective operation of the second trap would not be affected. All the drain-pipes from the closets, etc., are ventilated, and all waste-pipes from cisterns, etc., have separate outlets, and are cut off from the main drains.

The building is heated throughout by hot-water pipes, in addition to open fireplaces in most of the rooms. The water in the pipes is heated by steam from two steam boilers placed in the basement. Hot water is also supplied from the apparatus to the baths, sinks, and lavatories throughout the building.

The kitchen is fitted with a cooking apparatus by Messrs. Benham, and contrived on a principle used by the Government in barracks, workhouses, and other large establishments. From a single fire the operations of boiling, roasting, steaming, and so forth, can be carried on at the same time, it is stated, with great economy of heat and fuel.

The hospital is lighted throughout with gas. In the wards, and other parts occupied by the patients, care is taken to connect the gaslights with up-cast ventilating flues, so as to remove the products of combustion and assist the general ventilation.

The Health of Watering Places.

XVIII.—VENTNOR AND BONCHURCH.

THE health resorts which nestle under the lofty downs of the Isle of Wight possess special characteristics. They are part of an island of small size round which the sea flows freely, so that there is a breeze from the water to temper the heat of summer, and the effects of the Gulf Stream to moderate the cold of winter.

The consequence of this is that there is a more equable temperature in the Undercliff than in any other part of England. The mean maximum temperature for twenty-five years is 77·2 against 83·6 for Helston, and 88·0 for Greenwich. The mean minimum temperature for an equal period is 25·1 for Ventnor, against 25·8 for Helston, and 17·9 for Greenwich. The equability of temperature claimed for the Undercliff is well sustained by this evidence. Another matter is that the whole Undercliff, extending for miles from the Landslip on the east, to Black Gang on the west, is sheltered against all winds which are in the least degree northerly. This is secured by the formation of the Undercliff, which is a strip of sloping ground lying betwixt the high downs and the sea. It consists of an aggregation of extensive landslips, of falls of the material of the cliffs owing to the action of the water at their base. Some of these landslips are of quite recent origin. In many places the upper edge of these downs is abrupt, and forms a crest towering over the slope beneath. The consequence is that all the Undercliff is effectually protected from chill northern blasts. The sloping surface is, however, effectually fanned by every southerly breeze which comes off the sea, and so is rendered tolerable in the hottest weather by this current of moist and agreeable air.

The arrangements of the Undercliff permit of the invalid basking in winter in the sunlight, protected from cold winds; while in summer he is sheltered from the blazing sun by arbours of luxuriant foliage, and fanned by a pleasant sea-breeze.

The equability of the climate of the Undercliff is well illustrated by the character of its vegetation. There are of course the tamarisk, the verbena, the veronica, the euonymus, and the ilex; and further, the fuschia grows untended, forming beautiful hedgerows; the myrtle blooms freely, the magnolia presents its large wax-like flowers, while the laurel is laden with ripe berries, and the Portuguese laurel flourishes. The fig and the grape ripen freely out of doors, and behind the Hospital for Consumption the blue gum tree (the *Eucalyptus globulus*) grows apace. The different trees and shrubs are covered with climbing plants, the woodbine, the clematis, and the ivy, so that bowers are formed which no sunshine can penetrate, and in this cool shade the invalid can pass without exhaustion the hot hours of each summer day.

The whole arrangement of the Undercliff, indeed, is such as to develop to the utmost these natural advantages. Ventnor is not a town in the ordinary sense of the word, and can scarcely be said to possess streets. There are, indeed, continuations of houses along the chief highways, but they are irregular and built capriciously. It is, in fact, a collection of houses, most of them handsome villas standing each in their patch of ground, forming a garden, without order or symmetry. The consequence is that there are no terraces to intensify the summer heat and to mould the winter air-currents into draughts and eddies; while there

are sheltered nooks where the wanderer can rest in the shade in summer, and patches of wall where the invalid can sun himself in winter. In Bonchurch, indeed, the vegetation is so luxuriant that there is a comparatively long walk of dense umbrageous shade, cool in the hottest weather and the stillest day. Here visitors gather and watch the swans on the famous pond.

Indeed, there is everything that nature can secure to render the Undercliff a winter sanatorium, such as the like is not to be found in Great Britain; possibly, take all in all, not the like on the continent; for the effects of the Gulf Stream on the water which flows round the Wight are not in action on the collection of villas which stud the shores of the Mediterranean. There is much to entitle it to the term 'National,' which is adopted by the Hospital for Consumption. With greater facilities for reaching it, and some modifications of its present sanitary arrangements, the whole Undercliff ought to become a national sanatorium for all sufferers from diseases of the respiratory organs, especially during the winter months. To complete the natural advantages there is an abundant, indeed profuse supply of water, of excellent character. This issues from the face of the downs freely, forming little streamlets every here and there. At one time indeed there was a mill at Ventnor driven by the streamlet which runs into the sea at the east entrance to the Esplanade. In addition to these sources of supply there is a sufficiency of water furnished by a spring which was tapped in driving the railway tunnel through the downs. At the elevation of the station most of the Undercliff can not only be supplied with water without pumping, but there is pressure enough in most parts to throw the water to the topmost rooms of the houses quite freely. There is an abundance of water for all sanitary and hygienic purposes—and to spare. It is also a pleasant water, agreeable as a beverage. The slope of the Undercliff furnishes a capital descent for the waste water and sewage, and there is the sea to receive it, and a current to carry it away from the outfall. Every fortunate circumstance seems aggregated then to constitute the Undercliff one of the most favoured sanatoriums upon earth, and to render it the resort of the consumptive *par excellence*.

Having thus noticed a few of the natural advantages of the Undercliff, which are shared to the fullest extent by Ventnor and Bonchurch, it will be useful to examine their mortality statistics, with a view to estimate their sanitary condition, and to be able to judge how far these natural advantages have been supplemented by the due attention of local authorities to health matters.

Ventnor and Bonchurch, although really constituting one watering-place, are for all local government purposes two distinct communities. Previously to 1866 the area which now constitutes the parish and local board district of Ventnor formed part of the ancient parish of Newchurch. The new parish of Ventnor, having been created a local board district in 1866, became, under the Public Health Act of 1872, an urban sanitary authority, and the appointment of medical officer of health is held by Dr. E. R. Woodford. The parish of Bonchurch, and the new parish of Newchurch form part of a rural sanitary authority, to which we believe Dr. Woodford is also medical officer of health. We may here take the opportunity to call attention to the fact that there are no less than thirteen medical officers of health in charge of fourteen small sanitary districts within the Isle of Wight, whose aggregate salary is about 500*l*. per annum, while the average salary for each district is little more than 35*l*. Although here and there a medical officer of health may be found who performs the duties appertaining to the post as a labour of love, and without regard to its remuneration, there can, we believe, be little doubt but that the sanitary interests of the Isle of Wight would be best served by forming it into a combined urban and rural district, and by the appointment of a thoroughly qualified medical officer of health, who, debarred from private practice, would devote himself entirely to the improvement of the sanitary condition of the island. In case such an appointment were decided upon, at a salary but little exceeding the aggregate of those now paid, there can be no doubt that many eminent and experienced health officers would be willing and anxious to accept it. At the present time many parts of the island are practically without the advantages of a health officer.

For the purpose of an examination of the mortality statistics of Ventnor, we have been obliged to accept the area of the parishes of Ventnor and Bonchurch, and of that part of the parish of Newchurch situated within the Godshill registration sub-district, as representing the watering-place. In 1801 the population of this area was only 874, and it had steadily increased to 1,771 in 1841, thus doubling itself in forty years. Between 1841 and 1851 a very rapid increase of population set in, and at the census in 1851 the enumerated population was 3,578; the increase per cent in these ten years was 102 per cent. In the next decade the further increase of population did not exceed 17 per cent., whereas between 1861 and 1871 the increase was again more rapid, and was equal to 44 per cent. The population enumerated in 1871 was 6,007. Assuming that the increase of population within this area has been maintained since 1871 at the rate which prevailed during the ten years 1861–71, the population may be estimated at 6,755 in the middle of 1874, and at 7,004 in the middle of the present year. The death-rates to which we shall have to refer are calculated upon these estimates of population. It should be stated that the portion of Newchurch parish which we have been obliged to include with Ventnor and Bonchurch (as there is no means for ascertaining the population of what now constitutes Ventnor parish previous to 1871) embraces Wroxall.

During the year 1874 180 births and 136 deaths were registered within these three parishes; the births were equal to 26·6 and the deaths to 20·1 per 1,000 of the estimated population. The death-rate, however, requires correction for deaths in public institutions. During the year 14 deaths were recorded in the Royal National Consumption Hospital, which cannot correctly be referred to the resident population of Ventnor, whereas it may be estimated that of the 67 deaths which occurred in the Union Workhouse at Carisbrooke, 7 were of Ventnor and Bonchurch paupers. Deducting the 14 deaths in the hospital, and adding seven of those in the workhouse, the deaths in 1874 properly belonging to Ventnor and Bonchurch are reduced to 129 and the death-rate to 19·1 per 1,000. In seventeen other English watering places, the mortality statistics of which were recently discussed in these columns, the death-rate in 1874 ranged from 15·3 and 15·4 in Eastbourne and Ramsgate, to 22·3 and 25·2 in Yarmouth and Rhyl. The deaths in these three parishes in 1874 included five which were referred to different forms of fever, two to whooping cough, one to diphtheria, and not one either to small-pox, measles, scarlet fever, or diarrhœa; in all, eight deaths resulted from these seven principal zymotic diseases, equal to 6·6 per cent. of the deaths from all causes, and to a rate of 1·2 per 1,000 persons living. In the seventeen watering places the lowest zymotic rates in 1874 were 0·9 and 1·5 in Eastbourne and Ramsgate, and the highest 5·7 in Weymouth and 6·4 in Yarmouth. Scarlet fever was epidemic during 1874 both in Weymouth and Yarmouth. The proportion of zymotic deaths to deaths from all causes in these seventeen watering places in 1874 ranged from 6 per cent. in Eastbourne to 29 per cent. in Yarmouth.

With reference to the eight deaths from the principal zymotic diseases during 1874, in the area taken to represent Ventnor and Bonchurch, the following particulars may be mentioned. In the March quarter a death was referred to continued fever in High Street; in the three months ending June one fatal case of whooping cough was registered; in the September quarter a death was referred to enteric fever at Newchurch, and one to whooping cough in Windsor Terrace; during the last three months of the year a fatal case of typhoid fever occurred in High

Street, one of typhus in West Street, one of bilious fever at Wroxall, and one of diphtheria in North Street. No death was referred to diarrhœa throughout the year. Eastbourne was the only one of the seventeen watering places above referred to which enjoyed a similar immunity from fatal diarrhœa during the summer of 1874, whereas the death-rate from diarrhœa in the other watering places ranged from 0·9 per 1,000 in Llandudno to 4·9 in Margate.

It is much to be regretted that the death-register does not afford the means for distinguishing the deaths of visitors from those of natural residents. It would be valuable in the case of a town like Ventnor, credited with a climate especially favourable to those persons suffering from, or with a tendency to, phthisis and diseases of the lungs, to be able to calculate the death-rate from this class of diseases among the residents. It is, however, only possible to deal with the numbers of deaths from these causes registered. Excluding the fourteen deaths from phthisis recorded in the Royal National Hospital, thirty-eight deaths were registered from this disease during the year 1874, within the area taken to represent this watering-place; and eighteen from diseases of the respiratory organs, including bronchitis and pneumonia. The deaths from phthisis were equal to an annual rate of 5·6 per 1,000 persons living, and those from diseases of the respiratory organs to 2·7 per 1,000. The phthisis death-rate in 1874 in twelve other watering places, for which similar information has been obtained, ranged from 0·9 per 1,000 in Llandudno to 3·3 in Rhyl; the rate from diseases of the respiratory organs, principally inflammatory, was lowest 1·8 in Worthing, and highest 3·6 per 1,000 in Dover. Without more definite information, it would be useless to speculate upon the proportion of the thirty-eight deaths from phthisis in Ventnor and Bonchurch (excluding the fourteen in the hospital) which were of residents or of visitors. This subject is, however, worth local investigation.

Infant mortality in Ventnor and Bonchurch in 1874, measured by the proportion of deaths under one year of age to births registered, was equal to 117 per 1,000, against 151, the average proportion during the year in the whole of England and Wales. In the seventeen other watering places this rate of infant mortality in 1874 ranged from 95 and 98 per 1,000 in Worthing and Llandudno, to 180 and 187 in Rhyl and Southport. The twenty-one deaths of infants under one year of age in Ventnor and Bonchurch in 1874 included eight from diseases of the respiratory organs, six from premature birth, and five from convulsions, atrophy, or debility.

At the last census enumeration in 1871 the proportion of the population of Ventnor and Bonchurch, aged sixty years of age and upwards, was 79 per 1,000. Assuming that this proportion has been maintained, it may be estimated that in the middle of 1874 there were 534 persons living at these ages within the area taken to represent this watering place, among whom thirty deaths occurred during the year, equal to 56·2 per 1,000 persons living. The average death-rate in England and Wales during 1874 among persons aged sixty years and upwards was 72 per 1,000, and in seventeen other watering places it ranged from 56·4 in Weymouth, to 79·1 in Rhyl. The death-rate of elderly persons in Ventnor is probably somewhat under-estimated from the fact that the deaths of indoor paupers belonging to this watering place are recorded at the Union Workhouse at Carisbrooke, and some of them were doubtlessly of persons aged upwards of sixty years. It might, however, be fairly expected that the climate of Ventnor and Bonchurch, which is pronounced to be favourable for invalids, is also favourable for elderly persons, and there is little doubt but that after correction for deaths of elderly paupers, the death-rate among persons aged sixty years and upwards in 1874, would still be lower than that which prevailed in most of the other watering places.

Before closing this notice of the recent mortality statistics of Ventnor and Bonchurch, a brief reference to those relating to the mortality during the first nine months of this year will be useful. The deaths registered in the three parishes taken to represent this watering-place in these three quarters were 106, excluding thirteen in the Royal National Consumption Hospital, and including eight of the seventy-two deaths in the workhouse. With this correction the annual death-rate in the nine months was equal to 20·2 per 1.000, and somewhat exceeded the rate during the year 1874. In the nine months seven deaths were referred to the seven principal zymotic diseases, against eight during the preceding year. In the first quarter of this year a fatal case, each of remittent fever and diphtheria were recorded; in the second quarter two of diphtheria, and one each of continued fever and scarlet fever; in the three months ending September the only zymotic death was a fatal case of infantile diarrhœa. These seven deaths (of which it may be noted that the case of scarlet fever, and one of those of diphtheria occurred at Wroxall) were equal to an annual rate of 1·3 per 1,000, which was almost identical with the zymotic rate in 1874. It thus appears that the zymotic death-rate, during the year and three-quarters ending September 30 last was satisfactorily low compared with that in most other watering-places, but the fact that six deaths were referred to different forms of fever, including typhus, typhoid or enteric, and simple continued fever, during that period, points to defects in the sanitary condition of this watering place which appear to call for local investigation. In the meantime, it will not be out of place to allude to a few facts, which appear to show what direction sanitary improvement in Ventnor should take in order that this watering place might assume that high position among health resorts, which its natural advantages place so easily within its attainment.

We are becoming keenly alive to the importance of hygienic arrangements, and demand from every health resort that their sanitary matters shall be well and carefully attended to. It will not do to send invalids away, at great cost and expense, to health resorts, and then to find in doing so that they have been exposed to the risks of zymotic disease, and their lives imperilled or lost by defective arrangements in the place where they hoped to secure life and strength.

It is part of the duty of the public press, and particularly of that portion epecially devoted to matters sanitary, to protect the visitors and intending visitors to health resorts; and if the following remarks are felt by the people of Ventnor to be severe, the blame must lie at their own door. They have had no difficulties to contend with in the nature of their locality,—everything indeed is favourable to a degree. They have a liberal supply of excellent water, so much so that much of that furnished by the tunnel is run out at the other end to Wroxall, and poured into the streams on the other side of the downs behind the Undercliff. And yet there is an absolute insufficiency of water for the practical needs of the inhabitants. In many parts of Ventnor, and these the most populous, the water is cut off for many hours together, so many as ten. The dangers attaching to an intermittent water-supply are now notorious. As the water in the pipes is drawn out at some of the outlets, the mains fill with air, and if there be, as there almost necessarily must be, communications betwixt the water pipes and the system of sewerage, then the mains fill with sewer-gas. Further, if there be typhoid fever about, then it becomes disseminated over the town, as was recently well shown in the unfortunate cases of Lewes and Croydon. In Ventnor, however, such communication is abundantly provided by the numerous water-closets, few of which are supplied with cisterns. The protection furnished by cisterns is wanting, and the water-pipes, communicate directly with the closets. The arrangements for filling the water-mains with sewer-gas are as perfect as man can make them. The consequence is that when the water is again turned on, and the air driven out of the pipes, most offensive odours are felt in the.

houses; not always but frequently. If typhoid fever poison once get into the mains what the results might be can scarcely be calculated. It is possible that the outbreak might show itself in every house; it is certain that it would show itself in many. As a matter of fact the water of Ventnor has been known to be charged with gas when the service was renewed, until it presented the appearance of an aerated water. The local board of Ventnor have been officially informed that this is a fact. The plain truth is this—Ventnor with its present water arrangements seems to be like a mine, ready laid and prepared for epidemic diseases of the typhoid or choleraic kind, and only wants a spark to light it. The existing water-supply forms a trap for the unsuspecting visitor, and if typhoid poison once found its way, as it readily might from one isolated sporadic case, into the water-mains, the whole inhabitants might be stricken down to wrestle for life with our grimmest zymotic foe; and the death-rate would be terrible. Not only that, but such an outbreak—and how soon it will occur no one can say—would simply ruin the reputation of the Undercliff for years. The prosperity of the locality hangs, indeed, upon a mere run of luck which may change disastrously to-morrow. It is quite true that no such outbreak followed any of the six fatal cases of fever registered during the year and three-quarters ending September last. But if the wise precautions of the health officer got the population off scathless then, they may fail next time; and a momentary carelessness in an unskilled nurse may plunge the whole Undercliff into grave disaster, and cause the death of a large proportion of the unsuspecting residents. The present condition of matters is simply appalling, and it behoves the inhabitants of Ventnor to stir themselves forthwith, and at once to see that what is stated here as possible, is not soon an absolute fact which no regret and after activity can undo.

In spite of the abundance of the water-supply the charge for it is such that the hot and arid streets cannot be properly watered through the excessive cost of the water. Ventnor is no resort for poor people; its frequenters are drawn from the affluent classes, and yet the cool comfort of having the streets well watered in summer is denied, and this is the more exasperating because the water-supply is practically unlimited. Not long ago a house was on fire in the centre of the town, and there was ample time for it to have been utterly destroyed ere any reasonable supply of water could be secured. Many of the high-roads of the town have not so much as a main laid in them. Numbers of houses, of the expensive as well as the poorer class, have no supply of water except such as is provided by wells or fetched in buckets. It is a well known fact that at the National Hospital for Consumption, situated low enough down in all conscience, they cannot get in winter a sufficiency of water to supply the hot-water pipes which heat the corridors, and that remonstrances have been made by the London as well as by the local committee.

In strict justice we must say that we believe that the Ventnor local board has difficulties to contend against in the policy of the water company; but that is only the more reason that they bestir themselves. It is no excuse to us, no extenuation of their potential injury to their visitors, that by supineness they have got such a yoke upon their necks. If by their own indifference or neglect they have placed themselves in the power of any company, they must work out their own deliverance by a redoubled energy. It is monstrous that the finest winter sanatorium in Great Britain should be at the mercy of any one who can choose to deny the town and its visitors the first element of hygienic comfort and safety.

The water-supply of the Undercliff is its chief blot and drawback; but there are minor matters which need rectification. For instance, why should the sewer-pipe of Ventnor run out at the almost only bathing-place, forming, as it does, the line of demarcation betwixt the male and female bathers (who thus bathe in diluted sewage-water) when it could be carried eastward, and so placed that the currents would carry its contents readily away? Also, why in the name of common sense cannot some attempt at punctuality be essayed in the tiny local railway? It is about twenty miles in length, and yet punctuality is hardly ever attempted. It is most irksome to invalids, after a long and rapid journey, to change, say at Stokes' Bay ('the family route,') into a small steamer, then disembark at Ryde pier and change into tram-cars; after a ride of a mile or so, to change again into the railway train; and then to be dragged slowly along with numerous apparently incomprehensible delays, to Ventnor,—in an hour by the time-table, but usually much longer. The luggage at least passes without change from the Ryde terminus to the pier, but not the human freight. The tediousness, too, is aggravated by the numerous and reiterated demands to show tickets; this latter is, it might almost be imagined, resorted to when there remains no other excuse for delay. Some changes in the management of the Isle of Wight railway are greatly needed; they could easily be wrought, and they are urgently demanded.

Finally, if the natural advantages of the Isle of Wight were only properly developed by a suitable spirit of enterprise, advantages would alike accrue to the island, to the visitors, and to the inhabitants who profit by them. At present, however, many of the arrangements are inconvenient and careless in the extreme, and some of them are highly perilous to life.

Law Reports.

IS A CARAVAN A BUILDING?

W. H. HITCHCOCK has been summoned by the Lewisham Board of Works, for occupying a caravan unfit for human habitation.—The Board's solicitor said the proceedings were taken under the 13th section of the Nuisances Removal Act, which gave the magistrate power to make an order in reference to any house or building inhabited or let for occupation, and called the inspector of nuisances, who stated that he had inspected the caravan, which was standing on a piece of land eighteen feet frontage and forty feet in length adjoining St. Saviour's Church.—The defendant admitted that he lived and slept alone in the van, which contained a bedstead and bedding and a very large stove. The height inside the van was five feet nine inches, width five feet six inches, and length eight feet six inches.—The district medical officer said that the caravan was wholly unfit for human habitation, there being an absence of all appliances for domestic life, and the van being deficient in the matter of ventilation.—Mr. Scard, for the defence, said there was ventilation by means of a window, a chimney, and a door; but, independently of this, the caravan was neither a house nor a building within the meaning of the Act of Parliament.—Mr. Balguy said that was his opinion, and referred to persons who slept on board barges. The caravan did not come within the Act, and he must dismiss the summons.

SEWERAGE MATTERS AT DARLINGTON.

SIR C. HALL has had before him the case of *The Attorney-General* v. *The Mayor of Darlington*,—an application on behalf of the defendants that an order made in March last might not be enforced until June, 1876. By the order from which relief was sought it was directed that an injunction be awarded to restrain them until the hearing from bringing, carrying, discharging, or emptying, or causing or permitting to be brought, carried, or discharged into the river Skerne any sewage through or by means of the borough outlet or other sewer, and from otherwise polluting or permitting to be polluted the said river, and from interfering with the same in such a manner that any gases might be emitted therefrom, and any nuisance caused

thereby, to the damage, injury, or annoyance of the inhabitants along the banks or in the neighbourhood thereof. The Vice-Chancellor said it appeared to him that the corporation had been extremely dilatory. At the same time he felt that no good would be done by refusing absolutely the application for extension of time to make the necessary works; but he should give the defendants up to March 1 next, and not up to June. They must pay the costs, and if there should be a further application, as at present advised, he should not take the excuse that they were unable to get land. The proper course for them to take was to put themselves in such a position either by giving the necessary notices under Acts already in force, or to get a special Act for taking the lands compulsorily.

[The Vice-Chancellor seems to have spoken unjustifiably at random in advising the corporation to apply for a bill in Parliament at the moment he was refusing them the necessary time to do anything of the sort.]

CONVICTION FOR REFUSING TO SELL LARD.

T. SHEPPARD, cheesemonger, no. 111, High Street, Borough, has been summoned by an inspector of St. Saviour's District Board of Works, under the new Food Act, sec. 17, which sets forth, 'That if any officer or constable, employed by any vestry, or any legal authority, shall apply to purchase any article of food, or any drug exposed for sale, or on sale by retail on any premises, or in any shop or stores, and shall tender the price for the quantity which he shall require for the purpose of analysis, not being more than shall be reasonably requisite, and the person exposing the same for sale shall refuse to sell the same to such officer, he shall be liable to a penalty not exceeding 20*l.*—The inspector said that on November 5 he sent one of his men into defendant's shop to purchase half a pound of butter and half a pound of lard. As he was a long time in the shop witness went in to see the cause of his delay, when he saw Barker supplied with the butter. Witness told him to make haste with the lard, when the shopman took a bladder of lard, and as he was about to cut it the foreman came and spoke to him, when he put that bladder on one side and fetched another. Witness demanded to be supplied from the first bladder, which had been cut into, and tendered a florin in payment for half a pound. The foreman refused to let him have it, saying, 'He's a new shopman, and does not know you so well as I do.' Witness asked him if he knew him, when the foreman replied 'Yes; you are Errington, the inspector under the Adulteration Act.' Witness then told him he should summon him for refusing to serve him.—Mr. Benson fined the defendant 5*l.* and costs.

METROPOLITAN DRAINAGE ACT.

AT the Greenwich Police Court, Mr. W. J. Humphreys, of Rotherhithe, appeared to a summons taken out at the instance of the vestry of that parish, charging him with neglecting to comply with an order made upon him, in April last, to connect drains of certain premises with the main sewer, by which he had incurred a penalty of 5*l.*, or 40*s.* a day during the continuance of such neglect. In September, 1872, the consent of the vestry had been given to the defendant to construct temporary drains for premises about being erected, the plan submitted containing a proposal for a cesspool, and in the following month a fee of 1*l.* 4*s.* 6*d.* was paid to the vestry for a six-inch junction with an old existing sewer. A new main sewer had been constructed within sixty feet of the property in question, and it was now sought to make the defendant remove the drains he had laid down, and to replace them with others of larger dimensions.—Mr. Webb, for the defendant, said that it was contended that the drains already laid down were sufficient for permanent sewer, and that they were not only of six inches diameter, as allowed for temporary drainage, but that pipes of nine inches and twelve inches diameter had been laid, and a junction of nine inches diameter made in an old parish sewer, which was said to have its outlet in ground now forming part of Southwark Park. It was also denied that any cesspool or an excavation as 'a receiver' had been in existence on the property.—Mr. Balguy held that the defendant acted wrongly in putting in permanent drainage instead of temporary drainage, for which alone he had received the sanction of the vestry, in contemplation of a main sewer not existing at the time, and it was then arranged that the proceedings should be adjourned for a month to allow of the present drainage to be diverted into the new main sewer, at the expense of the defendant.

Correspondence.

THE EXTENSION OF CONTAGIOUS DISEASES.

(*To the Editor of the* SANITARY RECORD.

SIR,—I enclose copy of a memorial, unanimously adopted by 'The Bridge Rural Sanitary Authority,' at their last meeting, also a letter addressed to every sanitary authority in England, soliciting general co-operative action in the matter. The desirability of the object sought to be obtained, has, both in the columns of your journal and elsewhere, been so often and well expressed, that it is needless to dilate upon an acknowledged desideratum; suffice it to say, that with an increasing population, a more rapid and constant intercommunication with consequent multiplication of points of human contact, the danger from extension of contagious diseases become relatively increased, and hence the demand for the erection of new barriers for the public safety. I trust, therefore, that sanitary authorities throughout the kingdom will rise to the necessity of the times, and if they cannot, as advised by their responsible officers, adopt in full, the memorial in question, they will at any rate take some action, similar in spirit and intention.

M. K. ROBINSON,
Medical Officer of Health,
November 30, 1875. East Kent.

'Bridge Union Rural Sanitary Authority.—Sir, I am directed by the rural sanitary authority of this union to forward, for the consideration of your authority, a copy of a memorial presented to the Local Government Board, showing the necessity of legislative provision making it compulsory on persons and medical men to give notice to the sanitary officers of the existence of contagious or infectious diseases. I am requested to ask if your authority will co-operate with the Bridge authority in endeavouring to get such legislative enactments as will confer the above powers. I am, sir,

Your obedient servant,
ALLEN FIELDING, Clerk.

'Canterbury, November 25, 1875.'

'To the Local Government Board, Whitehall, London. The humble memorial of the Bridge Union Rural Sanitary Authority showeth,—1. That great difficulties are experienced by your memorialists and their officers in promptly checking the spread of contagious and infectious diseases, from the fact that the friends and relatives of persons suffering from such diseases fail to give notice of the existence thereof to the sanitary inspector or medical officer; and medical men in attendance upon persons so suffering in many instances hesitate to give such notice, in some cases, as your memorialists believe, from a feeling that it is a breach of confidence on their part voluntarily to do so. 2. That consequently some days are, in many instances, lost before the sanitary officers become aware of the existence of the disease, and during that time there may have been, and in the majority of cases has been, an utter neglect of sanitary precautions, and consequently the disease has been communicated to other persons, to be by them again, in consequence of similar neglect, conveyed to others and so spread over a large area. Your memorialists respectfully beg to suggest to your honourable

board the importance of legislative enactments, providing —(*a*) That it shall be obligatory on every householder (which word should include an hotel-keeper or innkeeper) to give notice to the inspector of nuisances of the existence of any contagious or infectious disease in his house, whether the person suffering be a member of his own family or be a lodger, inmate, or servant, within a certain period from the time of the existence of such disease becoming known to him, and that any person knowingly neglecting to give such notice shall, on conviction before two justices, be liable to a penalty. (*b*) That it shall be obligatory on every lodger or inmate in a house not being a member of the family of the householder, to give notice to such householder of the existence of any contagious or infectious disease in his own person, or in the person of any member of his family, or any of his servants, within a certain period from the time of the existence of such disease becoming known to him, and that any person knowingly neglecting to give such notice shall, on conviction before two justices, be liable to a penalty. (*c*) That it shall be obligatory on every medical man who shall be in attendance on any person suffering from any contagious or infectious disease, to give notice in writing to the inspector of nuisances, of the name and address of the person so suffering, and the nature of the disease, within a certain period from the time of the existence of such disease coming to his knowledge, and that for any notice so given such medical man shall be entitled to a fee; but that any medical man knowingly neglecting to give such notice shall, on conviction before two justices, be liable to a penalty.

Sanitary Invention.

LAVATORIES AND WAITING-ROOMS.

A COMPANY under the title of the Lavatories Company (Limited) propose to supply a want, by establishing lavatories, retiring and waiting rooms for ladies, gentlemen, and children. These rooms are to be opened in various parts of the metropolis, including the parks; always provided that the sanction of the authorities can be obtained. There can be no doubt that the provision of the accommodation contemplated will be of much service to the classes for whom it is intended, especially the ladies and children. The multiplicity of clubs at the present day affords, in great measure, to gentlemen the accommodation promised by the Lavatories Company; but ladies and children are still dependent on restaurants and pastry-cook shops. To them, therefore, the new company must look for support, which will doubtless be accorded to well managed and comfortable rooms of the kind proposed for the convenience of the public.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

BRUCE, Mr. Thomas Dundas, has been appointed Clerk to the Auckland Rural Sanitary Authority, vice Trotter, deceased.

BULLMORE, William King, M.D. Univ. St. And., M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Falmouth Borough Urban Sanitary District.

CONQUEST, Mr. Alexander W., has been appointed Surveyor and Inspector of Nuisances for the Ramsgate Urban Sanitary District, vice Clark, appointed Surveyor to the Corporation and Urban Sanitary Authority, Derby.

CROMPTON, George, Esq., has been appointed Treasurer to the Clay-Lane Urban Sanitary Authority.

DEVANY, Patrick Charles, L.R.C.P. Edin., L.R.C.S. Irel., L.A.H. Dub., has been appointed Medical Officer of Health for the Sligo Urban Sanitary District, vice Tucker, deceased.

DICKINSON, Mr. George, has been appointed Clerk, Surveyor, and Collector to the Leigh Urban Sanitary Authority.

ELLIS, Heber Dowling, M.R.C.S. Eng., L.S.A. Lond., has been appointed Certifying Factory Surgeon for the Bournemouth District.

FIGG, Mr. John, has been appointed Surveyor to the Brentford Urban Sanitary District, vice Gatward.

FREEMAN, W. Charles, Esq., has been appointed Treasurer to the Leigh Urban Sanitary Authority.

GREENOUGH, Richard, Esq., has been appointed Chairman of the Leigh Urban Sanitary Authority.

MACKINTOSH, Angus, M.D. Univ. Glasg., L.F.P.S. Glasg. and L.M., has been appointed Medical Officer of Health for the Clay Lane Urban Sanitary District.

NORBURY, Mr. William, has been appointed Inspector of Nuisances for the Leigh Urban Sanitary District.

RUSSELL, Mr. Charles, has been appointed Inspector of Nuisances for the Clay-Lane Urban Sanitary District.

TERRY, William Frederick, M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Tiverton Urban Sanitary District: 50*l.* per annum.

VACANCIES.

CHIPPENHAM RURAL SANITARY DISTRICT. Medical Officer of Health for the Pewsham Sub-District.

GAINSBOROUGH RURAL SANITARY DISTRICT. Medical Officer of Health. Inspector of Nuisances.

GOOLE URBAN SANITARY DISTRICT. Inspector of Nuisances, 80*l.* per annum. Surveyor, 70*l.* per annum. Collector, 30*l.* per annum. Applications, 10th instant, to George England, junr., Clerk to the Authority.

METROPOLITAN BOARD OF WORKS. Surveyor for Bethnal Green West. Surveyor for Bethnal Green East. Applications, 7th instant, to J. E. Wakefield, Clerk of the Board.

NUNEATON URBAN SANITARY DISTRICT. Inspector of Nuisances.

OSSETT-CUM-GAWTHORPE URBAN SANITARY DISTRICT. Medical Officer of Health.

STOKE-ON-TRENT URBAN SANITARY DISTRICT. Inspector of Nuisances: 100*l.* per annum. Application. 13th instant, to William Bagnall, Town Clerk.

SANITARY PATENTS.

3680. Improvements in the manufacture of gas for illuminating, heating, and cooking purposes, and in apparatus employed therein. Adam Aitchinson and James Aitchinson, Manchester.

3681. Improvements in the treatment of seaweed for the extraction of the iodo-bromides therefrom. Edwin Powley Alexander, Southampton Buildings, London.—A communication from Guillaume Jean Louis Herland, Paris.

3682. Improvements in the manufacture of ice, and in apparatus and moulds employed therein. John Gamgee, King's Road, Chelsea.

3687. Improvements in the manufacture of beer. Francis Neison Girdlestone Gill, King Henry Road, Regent's Park, London.

ABSTRACTS OF SPECIFICATIONS.

807. Animal Charcoal. C. Elcock, Manchester.

The features of novelty in this invention consist in making an artificial animal charcoal from a mixture of clay and sawdust, or clay and dissolved gelatinous animal substances such as glue, gelatine, or size, and then charring the mixture; such charcoal being capable of production either in a granular form or in the form of slabs, plates, or blocks, or in any other desired form as and for the purposes described.

1316. Washing machines and churns. J. Norris, Wood Green.

Washing machines require to be worked both forward and backward in order to produce good effect in cleaning clothes or other articles. To effect this purpose costly machinery with crossed straps and gearing to reverse the drum of the washing machine has hitherto been employed. For this purpose, according to this invention, a toothed wheel and sliding bearing commonly known as the 'Baker's patent mangle motion' is employed for the purpose of reversing the motion of the washing machine, which may actuate either a drum or grated hollow wheel with divisions or mid-feathers revolving in a cylinder, or the outer cylinder containing ribs or beaters may revolve and be reversed as above described. The same arrangement of mechanism may be applied to churns or beating machines where it is desirable to reverse the motion.

1318. Aerated Waters. W. F. C. S. Corry, Belfast.

The manufacture and preservation of aerated waters free from noxious ingredient or objectionable metallic or other impregnation, and the construction of apparatus and vessels therefor, consisting in whole or in part of glass, china, delft, porcelain, clay, earthenware, pottery, agate, flint, marble, or other stone, cement, alabaster, enamel, glaize, platinum, gold, silver, ivory, bone, horn, ebonite, vulcanite, indiarubber, guttapercha, asbestos, leather, hide, wax, shellac, resin, catgut, teak, cork, ebony, lignum-vitæ, oak, hornbeam, or other wood, paper, or other plastic material, or of a combination of the same which may be imbedded or enclosed within, or contain, or be supported by, metal or a combination of metals, or be used for coating or plating the apparatus or vessels heretofore employed.

1368. Purification of water. T. Spencer, Euston Square.

The object of this invention is to consolidate granular magnetic carbine (used for the purification of water) into solid but porous magnetic blocks of any shape, by treatment in an oven in mixture with flour, and then by increasing the heat to give the same coherence sufficient to render them applicable for portable and other filters. The means employed are also applicable to the consolidation of any ferruginous oxide or ferruginous refuse, and applicable to similar purposes.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer—not necessarily for publication.

STATE MEDICINE EXAMINATIONS.

(*To the Editor of the* SANITARY RECORD.)

SIR,—I wish to know whether there is to be a 'State Medicine Examination' at other places besides Cambridge, in about,—say, two months time. An answer in the SANITARY RECORD will oblige.

Nov. 24, 1875. THOMAS DAVIES.

[The Universities of London, Dublin and Edinburgh grant degrees in State Medicine. You had better write to the respective registrars to inquire for the dates when the examinations will be held.—ED.]

PIG-KEEPING.

(*To the Editor of the* SANITARY RECORD.)

SIR,—It is rather peculiar for a sanitary inspector to advocate that which may become a nuisance and injurious to health.

If I understand Mr. Apted's letter, he justifies himself in putting forward that it is desirable for the poor to keep pigs, on the assumption that they *may* be kept so as not to be a nuisance, and if they become a nuisance they can be readily dealt with by the law.

In telling your readers 'how to keep pigs,' he simply points out that the pigsty must be in a suitable place and not too near a dwelling-house, nor too near a neighbour's premises.

The difference of opinion, or the ground of controversy, if I mistake not, centres upon what is a suitable place for a pigsty, and how far it should be from the dwelling-house and a neighbour's premises.

If by a suitable place is meant a quarter of a mile, or more or less (according to the character of the soil), from any well or water-coufse from which drinking-water is obtained, and if by too near a dwelling-house is meant any distance less than 200 yards, and 200 yards from a neighbour, and that only one pig shall be kept on twenty square poles, two pigs on a rood, four on half an acre, and that not more than four pigs shall be kept by one person without the consent of the sanitary authority, and if Mr. Apted can deal with all others so easily as is pointed out in his clause three, under the 'law of keeping pigs'; then Mr. Apted's district will be tolerably free from pig-nuisances.

I feel quite at liberty to advocate, or, rather, to tolerate, pig-keeping—both from a profitable and a sanitary point of view—by sending them out, as is done at this time of year, or a little earlier, to range over hundreds of acres, and pick up their own living. I can also approve of them being kept in herds, as I have seen them in the American prairies, generally miles from a dwelling, and a nuisance to nobody, except now and then to an engine-driver, because they will not 'beware of the trains.'

I don't believe in the profit of pig-keeping by the poor; a pig kept by a cottager means waste rather than profit. Mr. Apted may not know that it is a practice, if not a custom, for the farmer's wife to have the poultry to farm for herself; the poultry are allowed the run of the yard and the tailings of corn, and no doubt it is very profitable, for the tailings of corn are not generally such bad food, since the men invariably want to see the 'missis' when they bring them to the house. Now, it strikes me that the cottager's wife also has a special interest in the pig-keeping, or the pig would soon be a nuisance at home; but, the cottager's wife has no tailings of corn to help her pig through.

Not a hundred miles from Essex there is a farm called 'Skim-Pot Farm,' which derived its name from the fact that the farmer's wife was particularly frugal, and took care of all her 'pot-waste,' and the farmer, instead of remaining tenant, became his own landlord. Now, it is an easy matter for a farmer's wife and a cottager's wife to let the pot-waste go to the pigs; but there should be no such thing as pot-waste, or it should be reduced to a minimum, and such a minimum that no pig will be the better for it.

On the page following Mr. Apted's letter in your 'RECORD' of last week there is a design of 'The People's Stove,' which, together with the cooking utensils (which seem to form a very essential part), seems likely to afford facilities for economical cooking, and means for the prevention of waste in the manipulation of food; good cooking appliances and the cultivation of good cooking will shut up the cottager's pig-sty. I look upon the pig-tub as a waste trap for cottagers, as a nuisance in itself, and a most pernicious institution. How much does a bad housewife hide in her pig-tub, and how often she silences her conscience with the palliation that the pig will eat it? The 'Tis Buts'* that get into the pig-tub, if properly used, would make a much larger sum in the savings' bank than the profit of many pigs. I would a hundred times rather advertise Mrs. Amelia Lewis's, or other economic cooking stoves and Mr. Buckmaster's lessons in cooking than advocate pig-keeping for cottagers. So far from a pig being a help by consuming the garden refuse, agricultural chemistry teaches that almost all refuse is more fertilising if dug in at once than it is after being eaten and digested by an animal.

It is possible that some medical man may take up the question of pig's flesh as the food of man, since Mr. Apted's letter leads to the conclusion that he considers it valuable; I will, therefore, only add that I believe if the Jew is wrong in his religious views, he is not far wrong in esteeming the pig as an unclean animal.

THOMAS REID,
Clerk, etc., to the Kirkby Lonsdale Local Board.
Kirkby Lonsdale, November 8, 1875.

* By J. W. Kirton. S. W. Partridge, 8 Paternoster Row.

TEMPERED GLASS.

THE Committee appointed by the French Society for the encouragement of National Industry report that they consider the chief objection to the use of M. De la Bassie's tempered glass is the difficulty of cutting it with a diamond.

GAS FROM CORK.

To the list of substances capable of furnishing illuminating gas of good quality, cork is now to be added. Recent experiments made in Bordeaux, says the *Scientific American*, have given results both economical and satisfactory, and it has been definitely decided to use the material in the lighting of the city. Works for burning cork are now in process of construction. The fragments of cork, principally waste left after cutting bottle stoppers, are distilled in a close retort. The flame obtained is stated to be whiter and more brilliant than that of coal gas, while the blue zone is much smaller, and the density considerably greater.

ASPARAGUS.

Hardwicke's Science Gossip (London: Robert Hardwicke, 192, Piccadilly) for November, continuing the history of our cultivated vegetables, has some interesting facts about asparagus, which is supposed to have come into use as food about two hundred years before the Christian era. Pliny mentions that three heads of asparagus grown in the gardens of Ravenna would weigh a pound. The Roman cooks used to choose the finest heads and dry them, and when wanted for the table, put them in hot water and let them boil quickly for a few minutes. Hence the proverb, '*Citius quam asparagi coquentur*' (Do it quicker than you can cook asparagus). The article mentions that asparagus is found growing wild in Cornwall, an island near the Lizard being called Asparagus Island.

THE HEALTH OF SYDNEY.

ACCORDING to the *Sydney Morning Herald*, notwithstanding all faults and deficiencies in the Sydney water-supply and sewerage, and notwithstanding the fact that its population averages 51·3 persons to the acre as against 45·1 to the acre for London and 36·6 to the acre for twenty-one British towns, the mortality returns (taking the mean of the last two autumns) showed 22·6 per 1,000 for Sydney, and 17·3 for its suburbs, as against an average of 27·1 per 1,000 for the twenty-one British towns, and 25·7 for London. It is, however, satisfactory to note that this clean bill of health does not prevent the Sydney people from recognising 'faults and deficiencies' in the water-supply and sewerage of their city, and that the Parliament of New South Wales has been occupied during the late session with projects of sanitary legislation.

MR. RUSKIN'S MUSEUM AT SHEFFIELD.

THE *Sheffield Independent* describes the house just purchased by Mr. Ruskin for a museum, the first of his 'St. George's schools for the workmen and labourers of England.' The contents of the museum will, at all events for the present, be confined to one room, it being an accepted principle with Mr. Ruskin and the St. George's Company, that a museum should, above all, be a place of education, and that everything it contains should have for its object the promotion of the highest moral and intellectual culture. Some of the first objects to be deposited are some of Turner's engravings, and some prints from Albert Durer's original plates. These include his 'Knight and Death,' 'St. George on Horseback,' 'St. George on Foot,' 'Pilate and Caiaphas.' Mr. Ruskin supplements the company's gifts by some of his own.

ARTESIAN WELLS.

THE Philadelphia *Times* publishes a letter showing that the water of artesian wells is not always fit to drink. There is an artesian well at Reading 2,000 feet deep, costing 22,000 dols., which contains forty-seven grains of Epsom salts to the gallon. An artesian well at Fifth and Cherry Streets, Philadelphia, containing 116 grains of foreign matter to the gallon, can only be used to condense steam for the boiler. An artesian well in South Street furnishes water not fit for steam. At Seventh Street and Passyunk Road there are two artesian wells, each 100 feet deep, but the water of both is so impure that it can only be used for condensing. The water of the well at the Continental Hotel is not pure. At Louisville there is a well 1649 feet deep, one in St. Louis, 2,080 feet deep, one in South Bend, and one in Terre Haute, but the water of them all is impregnated with minerals and fit only for medicinal uses. At Atlantic City a number of wells have been bored in the hope of getting pure water, but not one yields water fit for household use.

EARTH TO EARTH.—The superiority of the London Necropolis (Woking Cemetery) has been specially recognised in the *Times*, and other leading journals, and it is admitted that here only can the burial of the dead be properly carried out. The Company is prepared to conduct Funerals without the intervention of the ordinary undertaker at any stage of the proceedings. Prospectus free.—Office, 2 Lancaster Place, Strand, W.C.

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Original Papers.

HOW TO WARM OUR HOUSES.

BY WILLIAM EASSIE, C.E.

IF one thing be more apparent than another to the student of domestic appliances who has had years of experience in men and things, it is that in the matter of heating and ventilating our houses we have made of late years a gigantic stride for the better, and are fast discarding the older fashioned systems of heating which permitted the chief value of the coal to escape up the chimney.

We are, therefore, at dire war with all grates that allow but little escape of warmth into the room, and that heat by radiation simply. Only the best kinds of registers are now to be found in most of our ironmongers' shops, and even the cheaper ones are built upon approved lines with heat-retaining lumps of refractory clay behind them. Where the old-fashioned fuel-basket kinds are retained, they are coerced into something like the orthodox coving by means of 'coal-savers,' 'portable fire-backs,' auxiliary fire-grate fronts,' and other economisers. We are also reverting more and more to the ancient pattern of Count Rumford, and even when we cannot manage to accommodate his theory of angles to the space we have to spare when we have removed the patterns of our immediate forefathers, who sinned so terribly against economy and other things, we endeavour to do the best we can in the right direction.

We are also wise beyond compare in the construction and employment of ventilating grates which drag cold air from without, and heating it in gills of iron or terra-cotta behind, pump it into our rooms at floor, dado, or cornice levels. We have also striven to reproduce the dog-grates of the olden time, and have actually improved on it so far as to imagine and produce reversible basket-grates of this description, by means of which the smoke of the last shovelful of coals is compelled to pass through the incandescent fuel at the top. We have, moreover, sliding grates which can be brought forward into the room when once the fuel has ceased to smoke; and we have been in some cases enabled to project the heating surface of the stove into the room, and still keep the fire-box fairly back in the flue. Every day more or less novel grates are patented amongst us; and the question is, Where will invention stop? We have also brought to our shores the primitive heating-stoves of Russia, Germany, and Sweden, and brought ourselves into giving them a trial, careless of the fact that they are not suited to a nation like ours, which objects to being kept indoors all day merely because it happens to be bitter cold outside. We have patronised gas-stoves, too, of every possible construction; and have proved their demerits, halting only at the calorigen. Every kind of fuel has also been tried, in order to combine comfort with economy; old ship timbers have been at a premium, and we have only stuck fast at that apparently impossible material, peat.

All the time it is to be feared that we have been on the wrong scent, and that what was most to be cultivated has been most neglected—we mean the whole-house treatment, whereby the cold air entering our houses is genially heated, and so dispersed over the whole of the rooms. It cannot be gainsaid that this is the rational system of heating, and dispenses with a great deal of individual attention. The best warmed house is one in which the cold air from without is kept back by vestibules, and in which only a prepared atmosphere is allowed to circulate. We have many of us, therefore, discarded the use of separate fires altogether, and made use of coils heated by means of hot water, dotting them about the rooms and passages where considered most subservient to comfort.

We have lived to discover that steam-heating is not an admirable one in many respects—at all events in the house—and have improved on the ordinary hot-water circulation system so far as to make use of the high-pressure one. But we have not been all of us careful to note that unless we introduce at the proper place an inlet of pure cold air from without which shall play upon our pipes and coils, and so heat by convection, we are, after all, only heating by an extended plan of radiation. There are hundreds of houses heated by a hot-water apparatus, to which may be traced much that is evil. The pipes are, for instance, sunk below the floor, or behind coil cases where no one can reach them, and we breathe little else than the air laden with the products of combustion from dust and overweighted atmospheric impurities.

We do not for a moment imagine that hot-water heating is the end of all things good in the way of warming, or that we should hasten to abolish our open fires which greet us so cosily in our rooms; but we venture to say that this method of imparting a pleasurable glow of heat or sense of warmth has been very much neglected. M. Bonnemain first invented it in 1777 as a means of artificial hatching, and it was not until 1822 that the architect Mr. Atkinson introduced it as a means of heating houses.

The rate of progress which the system has made has been equally slow since, and it is not creditable to think at the present day that whilst it is in the power of nearly every householder to make use of it, very few avail themselves of its acknowledged benefits. Very many who have done so have had recourse to dangerous methods, notably that of heating the coils from huge boilers behind the kitchen fire, the hot-water circulating in an upstairs cistern. Thousands have lost their lives in this way, frost having set in and intercepted the supply of cold water to the cistern, and when a thaw set in the cold water has poured in upon the red-hot metal causing a fearful explosion.

In our impression of October 2 we gave our readers a lengthy and valuable article by Alderman Bailey, of Salford, upon this very state of things, showing the great superiority of the cylinder system, by means of which a circulating cistern at the top of the house is dispensed with, and the water heated in a small boiler close to the cylinder, the water in which can never be wholly evaporated. Householders should be careful to make choice of this great improvement of modern times, and on no account hark back to the failing methods of the past, however well recommended. The improved system has been several times explained in books on sanitary matters, and there will soon be no excuse for such wholesale slaughter as is brought about by a persistence in the old-fashioned method of low-pressure hot-water heating.

After all, our heating arrangements will remain more or less a question of economy of fuel. Many

mistakes will continue to be made in the choice of a boiler even in warming a room by means of hot water, especially when such water is partially withdrawn from circulation for ablutionary and culinary uses, and an addition of cold water made necessary to fill its place. Experience only and a careful comparison of the boilers can set this right. So it is with grates or stoves, and it is exercising no display of knowledge to say that the furnace or fireplace which best saves the expenditure of fuel and is otherwise free from offence will win the greatest amount of patronage in the end.

THE HYGIENE OF DRESS.

III.

Under and Outer Garments.

FROM what has preceded, it is evident that woollen stuffs are the best materials for clothing in every climate. In warm countries at noonday, when the vertical rays of the sun strike down in their greatest intensity, the want is to keep the heat *out*, and a bad conductor is as useful there for this purpose as it is in the Russian snows to keep the heat *in*.

'The old lady with her wraps of shawls and fur-lined hood, wending her way to her whist-party in St. Petersburg on a December night, has a strange counterpart in the gallant young European officer mounted on his Arab steed with his head enveloped in turbaned shawls six inches deep, traversing the plains of Hindustan under a burning sun in the month of June; yet both are practical philosophers despite the blow-hot and blow-cold objection.'

Hence, also, the flannel costume of the stokers in ocean steamers, who are exposed to intense radiating heat, and they are in this way enabled to bear and resist it; whilst we prevent or check the melting of ice by wrapping it in flannel or straw.

We have also established the fact that white is the best colour for protection against both heat and cold; and prominence should be given to this inculcation of the hygiene of dress. White should be the colour of all under-clothing worn close to the skin, and the colour of our outer garments should be light rather than dark, in winter as well as in summer. All dyeing is, therefore, not only a mere fancy, but the various hues impair, more or less, the property of fabrics in the essential function of protection from heat or cold.

The various dyes may do more harm than that. It is certain that they alter the condition of the fibre to an extent quite appreciable to persons of delicate touch, if not to everybody. Impressed with this fact some years ago, the writer was enabled to convey the idea of colour to a blind person, by fixing the attention of the latter on the 'feel' of each piece of stuff; and after a little practice the leading colours were invariably distinguished by the touch.

This alteration of the fibre may not only weaken but even destroy a fabric. Dyeing conceals dirt, and sometimes makes an inferior fabric seem a superior one—especially in the case of black, which is a notorious hypocrite among the colours.

Nor is that all. Dyeing may render a garment what the robe of Nessus was to Hercules—poisonous. 'Cases are recorded,' says Mr. Wanklyn, 'of damage being inflicted on the human skin—nay, of actual poisoning—through the wearing of clothing dyed with certain dyes.' The arsenical green is by no means the only dye that may be deadly to the wearer. Many of the colours 'come off' in the wear, as shown by the under-linen in contact with the garment; now, in contact with the skin, the colouring substance may be absorbed, and the consequence may be some mysterious malady which puzzles the medical attendant, and, as is sometimes the case when the causes of disease are continuous under treatment, baffling the most appropriate remedy.

Let white be, therefore, the colour of all under garments, to whatever extent we may permit fancy to revel in the hues of our outer habiliments.

Thanks, however, to the contrivance of modern textile manufacture, dyeing may be dispensed with, whilst a great variety of natural colours can be presented to the fancy. We allude to the undyed woollen fabrics introduced by Mr. Benjamin, the well-known tailor of Conduit Street. Here we have all the shades of brown from the darkest to the lightest, which are blended into a variety of patterns. The result is not only a necessarily 'wholesome' fabric, but one which must be much more durable than the ordinary dyed material.

Unfortunately, the natural black wool is not in sufficient supply to dispense with the dyer; but the darkest browns might well take the place generally of black, which is so very objectionable in the æsthetic point of view,—for black garments make short people look shorter, and detract from the imposing dimensions of 'the big ones.' If, however, the smoky and muddy season, as well as fancy, necessitates the adoption of the dark colours in winter, the fabrics should be rough and spicular,—for this condition of clothing materials repels cold, whatever may be the colour of the garment. Similarly, the dark colours may be rendered 'cooler' in summer by making the texture smooth and glossy.

In our climate the first requisite in any material for clothing must be that it will enable the skin to withstand the sudden changes of temperature to which it is liable, and which constitutes our chief climatic danger. As Dr. Halton observes, there are 2,500 filaments of nerves on every square inch of the skin, and it is of the first importance that they should be prevented from receiving the injury caused by a sudden change of temperature.

Our first care should be therefore devoted to the material which should lie next the skin night and day. In our previous article we demonstrated the objections both to linen and cotton, especially the former, as a good conductor of heat, and consequently conveying away the heat generated in the body with great rapidity,—besides retaining the perspiration caused by exercise and feeling wet and uncomfortable—the frequent preliminary to catching a cold.

A flannel vest should be worn next the skin all the year round, and in winter a pair of flannel drawers coming up high round the waist should be added. Attacks of diarrhœa, dysentery, or even cholera may be prevented by this protection.

In deference to the peculiar irritability of the skin in certain subjects, it has been suggested that fine linen or cotton may be worn under the flannel; but it must be obvious from all we have demonstrated respecting these tissues, that they cannot lie next the skin without disadvantage. If vigorous friction be applied to the skin, night and morning,

by means of the hair-glove, hair-brush, or by the hand all over the body, such irritability will be abated.

Objections have also been made to the 'animal matter common to the ordinary flannels;' but with habits of cleanliness no injury can possibly ensue from any such 'impurity.' We find, however, that a 'health flannel' is advertised, as 'freed from the animal matter;' and if this be the case, without injury to the fibre, it is certainly an advantage.

It is almost the universal habit to leave off flannel in the summer; but, with Dr. Halton and other authorities, we must pronounce the practice to be most injudicious. A thinner flannel vest may be used in summer, but it is precisely at this season in this country that the most sudden changes of temperature occur. Frequently, after a very hot day in June, the evening temperature becomes suddenly lowered; and a hot week is often succeeded by a week in which the weather is very considerably cooler, even in July.

In summer a cotton shirt may be worn over the flannel vest, while a flannel shirt should be worn over it in winter. We have recently found Scotch tweed to be an admirable substitute for flannel as the material for shirts, and its general use would not only be more economical, but add materially to our bodily comfort.

This mode of protecting the skin is suitable to all ages and both sexes, and its general adoption would undoubtedly produce a striking improvement in the public health. There would be lessened mortality from those diseases usually produced or aggravated by chill; and the nervous system being saved from many shocks of cold—to which it is so liable; the state of health of the individual would range at a much higher level, and he would thus be less liable to catch fever or other infectious diseases.

The Registrar-General attests the fact that, since the more general use of flannel among the poorer clases, there has been a great diminution in the mortality from chest-disease — especially among children; but, indeed, from all that we have said, such a result was a necessary consequence to be expected.

It is to young children especially that these cautions are applicable. The delusion, once so popular, that scant clothing of children, reaching in extreme cases almost semi-nudity, caused them to become 'hardy,' is at last disappearing from amongst the educated classes, and the truth is now recognised that it was only the exceptionally strong children who survived the treatment, while the weaker ones died off or fell into chronic ill-health. Among the less educated classes many grave errors still exist, and will probably continue to exist, until the laws and precepts of sanitary science become more generally diffused and obeyed. To keep the legs, and arms, and a great portion of the breast and neck exposed, is a terrible ordeal for young children to pass through as a sacrifice to the Moloch of fashion.

The tailor's part of our subject is, of course, all-important in the eye of fashion. A good fit is essential; but we must never lose sight of the requirement that all garments should 'give ample room and verge enough' to the walking and working limbs. In view of the function of the skin, the play of the vital organs, and the muscles, you might almost as well plaster the body all over as ensconce it in tight-fitting habiliments. Certainly there is now a tendency in both sexes to adopt the 'full and flowing' in their attire —as evinced in the home-spun dresses of women and the Ulster of the men—a veritable warm house to the wearer. In the latter there is, perhaps, a tendency to exaggeration—but no tegumentary contrivance ever equalled it in supplying all the requirements of hygiene, or was so capable of being co-ordinated to all the principles of æsthetics ministering to dignity, elegance and grace. In a future article we shall describe some few of the recent improvements in outer garments, now more than ever objects of interest in the severity of the present season.

Examples of the effects of insufficient clothing are every day seen in our hospitals, where many poor people are constantly admitted suffering from various chest-diseases caused by cold and wet. Many others fall victims to rheumatism from a similar cause, and this arises, as Dr. Halton observes, not so much from want as from ignorance as to the evils of wet clothes or wet feet, and consequent neglect in changing their garments.

Nor does the evil end here. 'The neglect of a physical precept produces a moral evil,—for there are many women of the humbler classes who, having clothed themselves in tawdry finery, and spent their money in ribbons and false lace, which would have amply sufficed for comfortable flannel—when they get wet and cold, resort to the dram shop to supply by artificial means the warmth their wretched clothing is unable to afford. Thus disease, pauperism, and death are often the result of an ignorance of the sanitary precepts we have propounded. But can we say that it is the women of the humbler classes only that err in this respect? Unfortunately, we cannot. Women of the highest rank now go to balls and assemblies dressed in a way which renders it difficult for them to escape some one or other of the multifarious diseases which attack the chest and the air-passages. The entire skin of the neck and upper back, with a good deal of the chest, is exposed to any chance current of air that may find its way into the heated room.'

All this is a needless and foolish sacrifice of health and life. Appropriate and sufficient clothing will enable them to maintain an even temperature under all circumstances; and if this be thus secured, the free circulation of the blood, a clear healthy skin, the bright animated countenance of health (and consequent good temper), will be the characteristics of the mothers and daughters of England.

DETERIORATED *VERSUS* ADULTERATED BREAD.

BY H. C. BARTLETT, Ph.D., F.C.S.

NOT the least injurious effect produced by the undue prominence accorded to the public discussion respecting the presence of alum in bread is occasioned by diverting the critical acumen of the analytical profession from the far greater detriment which is occasioned in bread by the undue diminution of its nitrogenous constituents, owing to the faulty method of making and baking, or to the use of damaged, inferior or unsuitable wheat flour. Indeed, the principal significance to be attached to the presence of alum in bread, to the extent of more

than ten or fifteen grains per four pound loaf, should be regarded rather as evidence of a previously damaged or inferior flour than as having been used as an adulterant *per se*, much less as a highly injurious addition, when the proportion does not exceed double the amount previously mentioned. It is, however, of the greatest consequence that the real reason for the use of alum by bakers should be understood, and I attach a much greater weight to the result of a nitrogen combustion of the suspected sample of bread to determine to what extent the flour has been previously damaged, than to the actual presence of a small quantity of alum, which has probably been used to enable this inferior and deteriorated wheat to work and become thoroughly vesiculated. Wheat, harvested during damp or wet weather, is liable to a second growth or sprouting; this may occur to a small extent only from other causes, such as defectively constructed granaries and bad stowage on board ship. From whatever cause this second growth occurs, flour will form a sweetened magma after its incorporation with water. In this condition the baker's sponge will neither set, nor can the loaf rise so as to make good bread. The greater portion of flour so detrimented is commonly utilised by mixing it with a more lively bread-making material, such, for instance, as is the flour supplied from America. With strong wheats, the addition of a certain quantity of these inferior flours does not lower the average of nitrogenous matter below that which all wheaten bread should possess, but it is necessary to wait until the sweetened condition has changed to acid before using alum, during which process there is a further loss of gluten.

From a vast number of analyses of various samples of wheat flour, spreading over a period of nineteen years, I am persuaded that the nitrogenous constituent of a fair average flour in its natural condition should equal at least 9 per cent. Flour of this nitrogenous value can only produce a bread equal to that of the Austrian commisariat, which, containing over 40 per cent. of water, retains only a little over 6 per cent. of nitrogenous substance in proportion to 46 or 47 per cent. of starch, gum, and sugar. As the Austrian commisariat bread is the lowest in the scale of standards adopted by military regulations, less than this proportion of nitrogenous matter must be considered as insufficient for the requirements of a labouring population. Any considerable quantity of alum, supposing it to be correctly estimated in the analysis of bread, would indicate a flour totally insufficient to produce bread good enough for ordinary purposes. If this conclusion were supported by an accurate estimate of the nitrogenous matter, and thus were found to corroborate the inference of previous deterioration, I cannot help thinking there might be good ground for prosecution, if the abstraction clause in the Adulteration of Food Act had included, as suggested to the committee of the House of Commons, the power to deal with articles manifestly wanting in their normal food values. Since, however, present legislation appears content to adopt my views only so far as to render wilful abstraction of valuable constituents a penal offence, the sale of deteriorated, inferior, or damaged articles, if not absolutely unfit for consumption, is a matter left to the discrimination of the purchasers.

The alum question, as discussed and debated from the past results of analytical research, is of value to the degree that it affords the opportunity of canvassing these broader considerations. But, in so far that this is of vastly greater consequence to the public than the present issues involved, it is most desirable that the controversy as to the method of analysis best adapted for its quantitative estimation should once and for ever be set at rest. I am not aware of any better method than that adopted by Professor Wanklyn for general use. But in all contested cases where the alum has been found by public analysts, it would be well to ascertain whether the alum had retained so much phosphoric acid as to cause a material difference in the estimation; this involves the rather complicated analysis suggested by Mr. Crookes. The bugbear inferred by some of the present disciples of *ACCUM mirabilis*, who continually do cry 'death in the pot,' as to alum in bread, has not of late been found to rest upon a very substantial basis; the small quantity present having very little real significance. If, however, the presumption that even these small quantities afford of an inferior quality of flour having been used, carries a sufficient conviction of the necessity of a proper estimation of the food value of what is termed the 'staff of life,' some real benefit will have been secured out of that which promised to be an angry interchange of invective between chemists taking different views of the question. Beyond this, the true comprehension of the dietetic use of different kinds of bread is a matter fraught with the highest possible interest to all classes of the community. We have, time out of mind, been contented with the very inferior product called 'households,' ignorantly and disgustingly manufactured with inferior, damaged, and even unsuitable materials. Fancy breads have been temptingly set forth for the delectation of those who could afford to pay more, possessing even less food value than the rough unpalatable food provided for the poor. At present the advent of a new epoch in English bread-making, it appears, may be anticipated. Whole meal bread, containing, of course if properly made, all the invaluable constituents of the finest wheat, can now be obtained in lieu of the uncertain and unsavoury article commonly termed 'brown bread.' Households (seconds) can be so manufactured as to present a high dietetic standard of bread stuff for the less wealthy; and it is foreshadowed that bread such as is now only procurable at Vienna will be shortly brought out, as a luxury for those who can appreciate it, by one of the most enterprising of our London bakeries.

IN the Queen's Bench on November 17 was heard the case of *Baker* v. *Mayor of Wisbeach*. The question raised here was as to the summary conviction of an owner of land, who, objecting to the passage of sewage through a ditch on his land, had broken some sewage pipes put into it to convey the sewage through it. The corporation had summoned him for maliciously injuring their sewer pipes. He set up a right to destroy them as wrongfully on his property, and, at all events, a reasonable belief in his right to do so, the ditch being, as he insisted, his. The magistrates, however, considered him to be wrong in imagining the ditch to belong to him, other lands draining into it; and they did not consider that he had acted under a reasonable belief in a right to destroy the pipes, and they, therefore, convicted him.—Mr. Justice Quain said that when a public body was concerned and had acted *bonâ fide*, this was not a proper mode of questioning their acts.—Conviction affirmed.

THE
SANITARY RECORD.
SATURDAY, DECEMBER 11, 1875.

The Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers read before the members of any sanitary or kindred association.

'NORTH BRITISH BUTTER-CLEANERS.'

THE question of adulteration of butter, which was first definitely raised at Liverpool in the great Kelly case, has left on the minds of the general public a legacy of doubt and uncertainty as to the meaning of ordinary English words when applied by the trade to designate different qualities of this article. The late Dr. Anderson, of Glasgow, gave, as a final report in this case, a curiously worded certificate, which, if capable of any interpretation, was to the effect that he knew nothing of butter or its analysis, and that, therefore, he had been unable to detect any adulteration in the putrid samples submitted to him. It is hardly satisfactory to find that the mantle of the deceased professor has descended to the present public analyst of Glasgow, and it is much to be regretted that his opinion, as regards the adulteration of butter with the vilest abominations, should have become even more pronounced as regards his inability to detect them than those expressed in Dr. Anderson's certificate. Even supposing that the analysis of butter is not yet the completely successful determination which could be desired, and that the detection of small quantities of other fats are difficult of exact proof, this would, in our opinion, only lead to a certain qualification of certificates. If it behoves analysts, on the one hand, to be careful not to give evidence of too definite a nature, as to the possible amount of adulteration in butter or lard, so, on the other, the least precaution due by them in certifying in favour of fictitious butter should be that they do not allow themselves to accord any scientific assent to the highly improper practice of naming these compounds as butter at all. Our readers will be astonished to find it stated in the columns of a contemporary, that a firkin of putrid grease, containing a candle without its wick, some Russian tallow, and other machine grease from a printing-office, has been treated by a North British firm and then submitted for approval to the Glasgow analyst. This gentleman is reported to have declared that 'very fair results have been attained,' which results turn out, according to the dictum, to be very superior to 'good commercial,' being actually 'prime stubble-fed British butter.' We have no objection to the employment of other suitable fats in lieu of butter for cooking when they are not sold under that name. We may go further, and say that we can quite believe that other fats in a fresh and wholesome condition may be so mechanically treated as to be superior to a great deal of the rancid unpalatable and extremely unwholesome butter now enjoying so large a sale. But that putrid butter, candles, Russian tallow, and printing-machine grease, can ever be so treated as to merit the certificate of the Glasgow analyst, leaving out of the question the fraudulent misnomer, is an impossibility so self-evident that the public have only to be made aware of the circumstances to avoid any such commodity having passed through the 'North British Butter Cleaners'' hands.

'ROUGHING' HORSES.

DURING at least three months every winter, we are subject to severe and sudden changes of weather, which render our streets so slippery that traffic is almost brought to a standstill. The ordinary pedestrian cannot help noticing the frightful difficulties experienced by horses drawing even light loads. The practical horseman knows that, leaving aside the risk of sprains and falls, the energy expended by a horse in keeping his balance over a mile of ice-covered road is quite equal to that required for a four mile journey under ordinary circumstances. But few persons, however, are aware of the result of all this misery—stables contain idle horses, lame and injured, for weeks after, and the horse-slaughtering establishments are crowded with the fatal accidents which occur all over the town.

This heavy loss is only avoidable by having the horse's shoes 'roughed.' Unfortunately this operation requires the removal of the shoes, which, besides being expensive, is not unfrequently productive of much damage to the feet. Horse owners, therefore, avoid 'roughing' as much as possible, and send their horses to work with smooth shoes, hoping each day will bring a change of weather.

We incline to believe that no prudent or humane man would find his economy in working his horse even one day in smooth shoes, if he were convinced of the success of any cheap plan by which a horse could be 'roughed' in the stable by his driver. The plan of having holes in the heels of the shoes, into which steel 'sharps' or spikes may be screwed when necessary, is pretty widely adopted in the West End of London, and, when done properly, is quite successful, but it is expensive, costing, in fact, nearly double the price of ordinary shoeing.

Mr. Fleming, of the Royal Engineers, has, however, tried a plan suggested to him from Russia, which he strongly recommends, and which is free from the objection of great expense. It consists simply of punching a square hole in each heel of the shoe, which in ordinary weather may be kept

closed by a piece of cork. In frost the cork is removed, and a steel spike inserted. If this steel 'rough' be made to fit the hole exactly, it remains firm in its place, and is not liable to break off short at the neck like some of the screwed spikes. The economy of this method consists in its saving the expense of the screw. Putting a 'thread' into the holes of the shoe and into the steel spikes is a tedious process, occupying much time, and therefore is costly. If Mr. Fleming's suggestion were widely adopted, the square steel spikes could be supplied at a very low figure, as machinery could be made to turn out three or four different sizes, each of uniform gauge, and the farriers could punch the holes to fit them with great exactness. We commend this plan to the notice of the large horse-owning firms, believing that it only requires a trial to establish it as the best system of 'roughing' extant.'

Christmas always brings a busy time for horses, and those who receive an annual hamper from the country know how, even in ordinary weather, the carriers are over-weighted, and the delivery of goods rendered very irregular. A return of the recent slippery weather during Christmas week would increase these difficulties tenfold, but the adoption of a good system of 'roughing' would save at least 20 per cent. in the cost of horse-haulage.

Notes of the Week.

A SCHEME for draining the Zuyder-Zee is now once more exciting much attention in Holland.

A MEETING of owners and ratepayers has been held at Lofthouse, Yorkshire, and a resolution passed to adopt the provisions of the Public Health Act, 1875.

THE Mayor of Stratford-on-Avon has called a public meeting, to be held at the town hall on December 8, to consider the great need for improved dwellings for the poor in that town.

THE Town Council of the borough of Portsmouth have unanimously resolved to apply for power to borrow the sum of 120,000*l.* for the purpose of street and other improvements.

THE number of wife desertions in the parish of Clerkenwell has become so considerable, that the Vestry have ordered the names of the husbands deserting thier wives to be printed and posted.

THE proposed meeting of ratepayers of Belper for the formation of a local board has been abandoned as inoperative; the Acts of 1848 and 1858, under which it was convened, having been repealed by the Public Health Act, 1875.

NOTWITHSTANDING the exceptionally cold weather of last fortnight, the mean temperature during that period being but 33·7° or 8·0° below the average, the fatality from diseases of the respiratory organs continues comparatively low. The number last week was 391, 74 below the corrected average weekly number.

AT an adjourned meeting of the ratepayers of Ashton, Lancashire, held last week, it was, after considerable discussion, resolved to form a local board for the district.

THE Manchester and Salford Sanitary Association, with the view of extending the usefulness of the lectures prepared and delivered by their members, have decided to issue them under the title of 'Health Lectures for the People.'

AT the last weekly meeting, the Metropolitan Board of Works resolved to seek an amendment of the Artisans and Labourers' Dwellings Act, 1868 (Torrens's Act), so that the Board might be declared the local authority exclusive of the City of London.

A SANITARY association has just been set on foot in Madras. Judging from the list of nuisances to which it has already called the attention of the local government, the exceptionally high death-rate of the city and the occasional appearance of epidemic cholera are not to be wondered at.

THE Local Government Board having, as the result of the recent inquiry, given powers to the Richmond Select Vestry to construct waterworks of their own, the vestry have purchased the 'Old Brewery,' with its deep chalk wells, and contracts to the extent of 25,000*l.*, have been accepted for the erection of the works. The Southwark and Vauxhall Water Company have served a writ for an injunction to restrain the Vestry from proceeding further in the matter, on the legal merits of the case, upon which the Local Goverment Board declined to express any opinion.

ON the 4th inst., Mr. E. H. Chandler, one of the guardians of St. Pancras, following an annual custom gave an evening entertainment to some fifty or sixty bedridden old women, the occupants of No. 24 ward in the workhouse. An excellent dinner, consisting of roast turkey and sausages, and pastry, had previously been provided for the old women, and at four o'clock they partook of tea. These comfortable meals were followed by an entertainment consisting of dissolving views, instrumental music and songs. It need hardly be said that both material and mental nourishment were highly relished by the poor bedridden old women.

MARKETS AND FOOD-SUPPLY.

A NEW poultry and provision market, adjoining the present Smithfield Meat Market, was opened on November 30. At the *déjeuner* which followed the ceremony, Mr. Sheriff Bright remarked that he had seen in the market several quarters of beef—fresh, beautiful, and of good quality—which had been slaughtered in New York, and had been brought over to this country to be sold. The meat had been stored in the hold of a vessel, and had been kept fresh by air from an ice-room being so directed as to continually pass over it. It was stated that the price realised was sufficient to remunerate the consignor. Columbia Market is also to be re-opened to the public, under the auspices of the Midland, Great Northern, and Great Eastern Railway Companies, the direction being entrusted to a committee composed of their respective managers. It is not to be now limited to the supply of fish; but will offer facilities for the sale of most commodities in general consumption, including fish, meat, poultry, vegetables, fruit, flour, hay, straw, grain, and earthenware. It is to be greatly desired that this beautiful market should fulfil the purpose for which it was originally destined by its munificent foundress, to enable the poorer classes of the dense neighbourhood surrounding it to procure articles of domestic consumption fresher, more wholesome, and at a more economical rate than they otherwise could.

DINNERS TO POOR CHILDREN

THE Earl of Shaftesbury and the committee of the Poor Children's Dinner Society appeal for funds to enable them to continue the supply of dinners at an almost nominal price to the poor children of the metropolis during the winter months. Though undoubtedly much good may arise from the occasional supply of good food to the underfed and destitute children of the metropolis, it is evident that an extensive charity of the kind requires the most careful management to prevent its degenerating into a means of removing from idle or ill-disposed parents the necessity of providing for their children, as well as an undesirable method of stimulating that morbid charity which has already done much to demoralise the labouring-classes in the East End of London.

THE CAUSES OF DISEASE AMONG THE WORKING-CLASSES.

IN the first of Dr. Richardson's lectures on 'Industrial Pathology, or the Influence of Certain Injurious Occupations on Death and Life,' the lecturer seems to have enumerated some wholesome truths which cannot be too strongly enforced on the attention of the industrial classes. He stated that he had found that a large number of working-men were very fond of attributing their maladies to what they called their work, but there were five causes of degeneration apart from their calling, of which the principal was intemperance; and the tables of statistics showed that the percentage of death amongst the class of persons who were engaged in the traffic of intoxicating liquors was the largest. Among other disturbing influences among the working-classes, the lecturer instanced and described the food-supply, the hereditary proclivity to disease, poverty, and inattention to cleanliness.

POPULAR LECTURES FOR THE WORKING CLASSES.

ON the evenings of Nov. 24 and Dec. 1, an audience of upwards of 200 working people assembled in the school-room of St. Mary's, Whitechapel, to hear a lecture from Dr. J. J. Pope, late of the Royal Artillery, on 'Number One, and how to take care of him.' The necessary expenses of the lecture were defrayed by the above society, whose offices are at 63 Berners Street, W., and whose object is to diffuse a knowledge of the laws of health in every direction. Both lectures were well adapted to the audience, being a judicious admixture of grave and important facts connected with ventilation and food, and amusing illustrations and anecdotes calculated to fix the truths inculcated in the minds of the hearers. The assembly seemed to be greatly interested in the lecture, and it is to be hoped that a repetition of such efforts may in time produce some effect on the mass of ignorance which exists in our dense population as to the most simple matters relating to a healthy life.

THE SNOW IN OUR STREETS.

THIS subject is once more receiving attention in the columns of our contemporaries, and no wonder, for much mischief is resulting to man, beast, and property from the unsafe condition of our main thoroughfares. It has been dangerous to walk on the asphalte of the road because of the slipping about of the horses, and equally dangerous to walk upon the pavement, for a layer of snow hid the iron and glass bulls-eyes and gratings, causing an involuntary slide. Some suggested salt as a remedy, and the St. Pancras Vestry gave permission in October last for the General Omnibus Company to melt what snow they could in this manner along their route through that parish. But it would be impossible to salt as liberally as the heavens do snow, and we fear that salt will not therefore prove an effectual cure. Others again suggest the use of sand; but this would act prejudicially upon the surface of the asphalte, and pit it over with holes.

We do not think that it would be wisdom for us to construct our roads with much reference as to what would befall them in a week or so if snow fell, and believe that it would be wiser to treat the snow as an interloper, and get rid of it as soon as possible. Here, however, it is very evident we miserably fail, and a race as to priority of incompetence is run by the contractors. The whole burden of the snow cleaning should be laid upon them, and they should cleanse the pavements as well. It not unfrequently happens that the street is partly shovelled up before the snow is brushed from the pavement, and the result is ridiculous to see.

There can be no doubt that our plan of treating the snow is an absurd one; taking the trouble to cart it away to the river or elsewhere. The feasibility of erecting snow-shafts at the sides of the main sewers was once mooted. Near each shaft was to be a convenience for erecting a stand-pipe, with screw nozzle, hose, and fan-spreader, and when a heavy fall of snow occurred, the shaft covers were to be opened and the snow washed, or in some cases carried to the shafts, which would be some 100 yards apart, water-tight at bottom, and discharging into the sewers, and the snow would thus speedily disappear. Some one else suggested the employment of engines made to eject jets of steam or boiling water. But we doubt whether either idea was tried, and 'here we are again' as exactly as before, as will be the Christmas clown in the theatre.

METROPOLITAN WATERS.

THE following are the returns made by Dr. Letheby to the Society of Medical Officers of Health of the composition and quality of the metropolitan waters in November, 1875:—

Names of Water Companies	Total Solid Matter per Gallon	Oxygen required by Organic Matter, &c.	Nitrogen		Hardness	
			As Nitrates, &c.	As Ammonia	Before Boiling	After Boiling
THAMES WATER COMPANIES.	Grs.	Grs.	Grs.	Grs.	Grs.	Grs.
Grand Junction . .	21·03	0·173	0·115	0·002	16·5	4·2
West Middlesex . .	20·17	0·057	0·135	0·000	16·0	3·3
Southwark & Vauxhall .	20·87	0·169	0·131	0·002	16·5	4·2
Chelsea	20·70	0·126	0·131	0·001	16·0	4·0
Lambeth	20·73	0·145	0·147	0·001	16·0	3·8
OTHER COMPANIES.						
Kent	28·17	0·019	0·344	0·000	20·6	6·0
New River . . .	20·67	0·054	0·147	0·000	16·0	3·3
East London . . .	21·23	0·070	0·184	0·001	16·0	3·8

Note.—The amount of oxygen required to oxidise the organic matter, nitrates, etc., is determined by a standard solution of permanganate of potash acting for three hours; and in the case of the metropolitan waters the quantity of organic matter is about eight times the amount of oxygen required by it.

The water was found to be clear and nearly colourless in all cases but the following, when it was slightly turbid—namely, in those of the Grand Junction, the Southwark and Vauxhall, the Chelsea, and the Lambeth Companies.

The average quantity of water supplied daily to the metropolis during the preceding month was, according to the returns of the water companies to the Society of Medical Officers of Health, 117,744,905 gallons; and the number of houses supplied was 521,068. This is at the rate of 34·2 gallons per head of the population daily. The last official return from Paris stated that the average daily supply per head of the population was 28·2 gallons; but this includes the water used for the public fountains and for the ornamental waters in the Bois de Vincennes and the Bois de Boulogne.

UPPINGHAM SCHOOL.

THE following report was adopted at the meeting of the Rural Sanitary Authority of Uppingham on the 7th inst.

To the chairman and members of the Rural Sanitary Authority of Uppingham.—Gentlemen,—Hearing that the masters of the Uppingham School will probably meet on Friday next, when we presume they will take into consideration the re-opening of the school, we deem it our duty, as the reports we are preparing are not yet finished, to present an interim statement. We find that the condition of several of the school-houses is such as to necessitate material alterations in their sanitary arrangements. With a view to facilitate such alterations Mr. Rogers Field, your engineer, has, in accordance with your resolution, placed himself in communication with Mr. Tarbotton, engineer to the schoolmasters, and he has every reason to believe that means are being taken by the school authorities to expedite the necessary works. Until, however, these are completely carried out so as to enable us to report to you that each individual house in connection with the school is in a perfect sanitary condition, we think it desirable that you should not in any way countenance a premature return of the scholars.

We are, gentlemen, your obedient servants,
ALFRED HAVILAND, Medical Officer
of Health to the Rural Sanitary
Authority of Uppingham.
Northampton, December 4, 1875.

ROGERS FIELD, Civil Engineer.
5, Cannon Row, Westminster, S.W., Dec. 4, 1875.

SCARLET FEVER AND QUARTER DAY.

A MEDICAL practitioner points out the necessity for everyone who is about removing from his old residence to a new one, making full inquiry as to the sanitary antecedents of the family going out, so as to be quite certain that no one has lately suffered from scarlet fever or other infectious disease. He states that a family residing in his neighbourhood, who had suffered for two months from scarlet fever of the most virulent type, from which two children had died, had just vacated the house. The following day a widow lady, with a family of young children, was coming in, when he informed her of the fact, which had previously been kept from her. As the house had not been cleansed or disinfected, she sent her goods to a warehouse instead of placing them in the infected house.

There can be but little doubt that disease is frequently spread in this manner, for when scarlet fever or small-pox appears in a house it is almost always 'kept quiet,' because, directly it becomes known, no friends will come near for a month or two, or will receive the visits of a member of the family, so that they become almost cut off from the world. The medical attendant is usually requested to say nothing about the matter; and as there is no law to compel him to give the necessary information to the local authority of the district, no one knows of it, the children mix with their old schoolfellows and playmates much too soon, the bedding, bed-clothes, and wearing apparel, are not disinfected, and the house remains untouched except with soap and water. If the family wish to remove, the objection to the outbreak being known is stronger, for fear that the sanitary authority will prevent the removal of the goods until everything exposed to infection has been destroyed or properly disinfected.

If the medical attendant were compelled by law to give notice to the sanitary authority of the occurrence of infectious diseases, and if children who had suffered from them were prevented from going out of the house until a written certificate had been given, the spreading of scarlet fever would be prevented to a very great extent. It is true that an owner knowingly letting a house which has been occupied by a person or persons suffering from an infectious disease without previous disinfection can be fined, but as the law does not compel those who have so suffered to give him information on the subject, the penalties provided by the Act in many cases would not be recoverable.

CIVIC FRATERNISATION.

NOTHING can be more desirable or more likely to promote the good government of the metropolis than the existence of friendly relationships between the several bodies that share its local councils. That these friendly relationships have not always prevailed is matter of notoriety, and it is a worthy object to promote anything which is likely to lead to their establishment. On this account, we are glad to direct attention to an entertainment of a somewhat novel kind—or at least with a somewhat novel feature—which was lately given at the Albion Tavern, Aldersgate Street, by Mr. J. T. Bedford, who is well-known as an able and popular member of the Court of Common Council and chairman of the Local Government and Taxation Committee of the Corporation of London. Dinners given by chairmen of corporation committees are no novelties. But they have been usually hitherto almost entirely private entertainments, and confined principally to members of committees or other members of the corporation. The excellent aim of Mr. Bedford, however, in giving the particular entertainment to which we refer was to bring together those who are 'prominently engaged' in the local government of the metropolis and others who had taken a prominent share in the discussion or promotion of matters affecting the public welfare. The 'happy thought' of the estimable chairman of the Local Government and Taxation Committee of the Corporation led to the bringing together of a thoroughly representative gathering, including the Lord Mayor, the chairman of the Metropolitan Board of Works, the chairman of the Metropolitan Asylums Board, the chairman of the London School Board, chairmen of Local Metropolitan Boards of Guardians and other district boards, together with a few distinguished 'visitors' or persons outside the pale of the corporation and of the other municipal bodies. Mr. Bedford stated his object to be to bring all these persons together so that they might have a 'friendly talk' over matters concerning the public good; and one of the earlier toasts of the evening, proposed by the chairman and host was, 'The School Board, the Asylums Board and the Board of Guardians,' three bodies which, he happily remarked, 'had gained many victories against ignorance, disease and poverty.' Altogether this semi-civic, semi-popular gathering, inaugurated and carried out by Mr. Bedford, was a success in every way. Its object was excellent, and as we believe it was the first of a contemplated series of similar meetings, we heartily wish for them the continued success which they deserve.

FLOCK BEDS.

WHAT becomes of infected rags is a question which is important to the manufacturers of flock for beds and mattresses, and for those who use them, as well as for the public at large. It may not be generally known that the various steps in the process of flock-making are somewhat as follows: Rags are collected from marine-store dealers and rag shops, and conveyed to the mills, where they are first dried and sorted, and then, without any cleansing process, passed over or between revolving cylinders furnished with steel teeth or fangs, by which they are torn into flock. In this operation clouds of dust are given off, and carried by the wind to a considerable distance from the mills. These rags consist partly of the pickings of ash-pits and the tatters which can no longer be worn by their wretched owners, as well as, it may be, the worn out pieces of calico which have been used for poultice rags or for other similar purposes for patients suffering from infectious diseases. This is no imaginative picture, as the poultices with the enclosing rags were two or three years ago thrown into the dust receptacles at one of the largest metropolitan small-

pox and fever hospitals. When the dust was removed and shot down at the dust-shoot, the rags were picked out and carried to a rag shop in the neighbourhood and sold there. When the fact came to the knowledge of the medical officer of health, he stopped the practice, but as it had been going on for some months before he knew of it, no one can tell what injury to health may have occurred. As the rags, when collected, are often in a filthy state, they certainly should be disinfected and washed before being worked up into flock mattresses and sold to the public to sleep upon. We do not say that all flock mattresses are made of these materials, or even that the best contain any; on the contrary, those supplied as being of best quality by respectable houses are unobjectionable on sanitary grounds. Attention was called a short time since to the washing and re-dressing of lint which had been used at a large metropolitan hospital for dressings, and to the manufacture of lint out of the poultice rags; but even this is scarcely so objectionable as the manufacture of flock out of rags which have been exposed to infection without any cleansing or disinfection. We do not intend to say that we have traced any of these rags to the flock-makers, but only point out the probability of such things happening. A correspondent of the *Glasgow Herald* has called attention to the matter, and we have considered it our duty to follow up the unpleasant subject. In order to prevent any such risk in future, we would earnestly recommend the burning of all rags which have been used for patients suffering from infectious diseases, instead of allowing nurses or servants to throw them into the dusthole.

BUTTER AND THE PUBLIC HEALTH ACT.

WE have not had long to wait for a good illustration of the tentative and, in a certain sense, imperfect character of the 'Public Health Act, 1875.' The stipendiary magistrate at Manchester has just given a decision which, though undoubtedly good in law, is very bad in equity.

A wholesale confectioner was summoned for having on his premises butter which was putrid and unfit for food. The condition of the material had been proved at a previous hearing, and the superintendent of markets, who prosecuted, was about to call a witness to show that it had been intended for human food, when Mr. Cobbett, who appeared for the defence, pointed out that the Nuisance Removal Act, under which the summons had been issued, was repealed by the Public Health Act, 1875. The latter Act, however, contained a clause (Clause 116) exactly similar to one in the former, empowering the authorities to take proceedings only for the possession of any 'animal, carcass, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk.' There were no general words. The summons charged the defendant with 'having deposited for sale certain meat—to wit, thirteen tubs of butter;' but butter could not be described as meat, and therefore the summons must fail. As the law stood, there was no power to prevent any one from selling bad butter. The magistrate agreed with Mr. Cobbett, and expressed a wish that when the Legislature passed the Public Health Act they had done it in a proper form. He asked if Mr. Page had any observation to make, and Mr. Page said he did not see how, by any ingenuity, butter could be made into poultry, fruit, or game. The case was then dismissed.

That this decision rests upon no misconception is made clear by a letter written to the *Times* by Mr. Lumley, of the Local Government Board. His defence is, that 'the present clauses are only re-enactments of the previous law, which did not provide for butter. When the amending Act of 1874 was in the Committee of the House of Commons, the terms "butter, cheese, eggs, and milk" were inserted in the clause extending the operation of the previous Act; but when the bill was reconsidered by the House, the words "butter, cheese, and eggs" were rejected. It would not have been proper, in presenting a consolidation bill, to introduce words which the House of Commons had rejected in the previous year, though the omission may be considered by many persons as a matter for regret.' We think so too.

The question at issue (and it is one of many such) is so serious to the community at large, that we trust that Mr. Sclater Booth will not fail next session to take steps for bringing about an amendment in the recent Consolidation Act. Indeed, if Parliament were to devote its attention during one or two sessions to the settlement of a good series of supplemental amendments to the present law, and the session next following to the re-enactment, in an approved form, of the Public Health Act, 1875, then a certain stage of finality might be considered as reached, and the subject of Public Health and Local Government Law left at rest for a short term of years.

SALT AND SNOW.

A WRITER in the *Daily News*, of the 4th inst., bears the following testimony to the advantages of salting the roads for the removal of the snow, advocated in the SANITARY RECORD, No. 73. He writes:—'For the first time in some, if not all, of the trade-way districts, an experiment was tried which was none the less injurious because of the absence of frost. The salted roadways were a new experience for London, as any one might see who had the opportunity of contrasting them with the thoroughfares that were left to their sloughs of despond, and who were not compelled to wade in the freezing mixture thus produced under the sanction of parochial wiseacres. Throughout the whole of the day horses floundered and waggons stuck fast upon the uncleared ordinary paving stones; it was a little better upon the asphalte, which, many hold, under any conditions offers a perilous foot-hold for horses shod in the usual method; the few and far between wooden roads were good, if they had been thoroughly cleared of the muck; but the tramroads, upon which salt had been scattered, retained, of course, no vestige of the snow. Drivers who had in the other parts of the town been compelled to proceed at a snail's pace with a tight rein and wary eye upon them, were able to apply the whip and go at full speed. It is true the liquid mire looked more like punting than driving, but it was liquidised to a maximum degree, and though the horses' feet must have suffered from their bath in the coldest mixture science knows, the salted snow offered no obstruction to traffic, requiring only time to drain away of its own accord.

The operation seems very simple and unexpensive. A vehicle which, roughly speaking, resembles a water-cart, fitted with tram wheels, runs over the track, laden with salt, which men sprinkle upon the way as they progress. It is the machine used at other times of the year for sanding, but the chemical properties of salt prevent the use of the scattering apparatus which answers with the dryer material. The salt which has thus mastered the snow is 'ground rock salt.' We are glad to perceive that the other daily metropolitan journals notice that much suffering to horses was prevented in the thoroughfares where salt was used to melt the snow.

The article in the *Daily News* then proceeds to comment on the new snow-ploughs used upon the districts under the immediate supervision of the Commissioner of Works as very effectual in their way; in Hyde Park, both upon the carriage-drives and footpaths, they speedily threw up walls of snow on either side, leaving ample and clear space in the centre for the passage of vehicles and pedestrians.

'A Fellow of the Royal College of Physicians, London,' writes to the *Times*, December 7:—'To throw salt upon snowy pavements is not merely a dirty and idle habit to save the trouble of scraping and sweeping, but it is one fraught with danger. Snow and salt, when mixed together, form a muddy liquid of the temperature of zero, or 32 degrees below the freezing-point of water,—a degree of cold long considered to be the lowest attainable, and it needs not to tell how dangerous must be the saturation of the shoes with such a liquid. The practice should not only be prohibited, but it should be made a penal one.'

In reply to this it is necessary to point out that the writer does not consider that, owing to absorption of heat from neighbouring objects, the temperature of a freezing mixture does not fall unless the mixture be in a compact mass. Spread out in a thin layer, as in actual practice it would be, the salt and snow would not sink in temperature to the degree supposed by the objector.

Medical Officer's Report.

ANNUAL REPORT OF THE MEDICAL OFFICER OF HEALTH FOR THE ST. GILES'S DISTRICT. 1874.

THE late Dr. Ross, who was highly esteemed by all who knew him, was strong in vital statistics. He commenced this report by making a comparison between the annual death-rates for the whole metropolis since 1840 and those for his own district, and stated his belief that the improvement in St. Giles's had been more decided than for all London, 'owing to the greater need and larger opportunity for improvement than in the more extensive area.' He next showed that in 1874, whilst the death-rate in the metropolis was 22·5 per 1,000 population, it was as high as 25·7 in St. Giles's district, and that whilst in all London the birth-rate was 35·7 per 1,000, in St. Giles's it was only 29·2 per 1,000 inhabitants. He also pointed out that these variations would have been somewhat different if the number of births and deaths registered in the district had been accepted as correct, for, instead of the whole of the 1,725 births registered belonging to St. Giles's, there were only 1,562, and instead of 1,247 deaths, which was the registered number, there were really 1,372 which belonged to it. These corrections show the necessity of each officer of health ascertaining by careful inquiry the actual number of births and deaths which should rank on the rolls of the parish or district, instead of accepting the uncorrected birth and death-rates of the Registrar General. We say uncorrected because the returns for the metropolitan districts are only corrected in the annual reports at long intervals for deaths in hospitals and similar public institutions, and we believe not at all for deaths in workhouses which do not belong to the districts in which they are situated. We do not blame the Registrar General for this, as these corrections involve much trouble, which every officer of health should undertake for himself.

Dr. Ross next calculated the annual death-rate per 1,000 in the subdistricts, which can be done with considerable accuracy in such a district as St. Giles's, where the annual rate of increase varies but little from year to year, but which would be likely to lead to great errors in the outlying metropolitan districts, where building operations are going on very rapidly, and the population therefore increasing more in one subdistrict than another. The death-rate in the subdistricts varied enormously, having been 31·5 per 1,000 inhabitants in St. Giles's south, 25·9 in St. Giles's north, and only 20·5 in St. George's, Bloomsbury. He observed in these facts that 'the district of St. Giles may be regarded as a typical one, it being constituted by the comparatively healthy parish of St. George, Bloomsbury, the medium subdistrict of St. Giles North, and the destitute and unhealthy one of St. Giles South.' The different proportions of deaths under one year to total births in these subdistricts accounted to a certain extent for the varying death-rate as in St. Giles South there were 23·8, in St. Giles North 16·4, and in St. George, Bloomsbury, only 13·9 deaths out of each 100 births. Dr. Ross, however, does not seem to have made any allowance for the much greater number of servants and others in the prime of life, who were living in St. George's, Bloomsbury, as compared with the percentage living at those ages in the other subdistricts. This comparison is in all cases most important, as the mortality of a district, other circumstances being equal, depends chiefly on the proportion of middle-aged to the old and young. Dr. Ross was fully aware of this fact, but did not mention it in this report.

The table of deaths from the seven principal zymotic diseases showed that measles, scarlet fever, and fever caused an excess of deaths as compared with former years, whilst whooping-cough and diarrhœa were much less fatal than usual, and that there was not any death from small-pox against an annual average of 13·1 per 1,000 inhabitants during the previous ten years. The total deaths from these diseases was 159 per 1,000 deaths from all causes, against 146 for all London. The death-rate from pulmonary affections, excluding phthisis, was 256, from tubercular diseases 138, and wasting and convulsive diseases of infants 126 per 1,000 deaths. These figures show an excessive mortality from pulmonary as compared with other diseases, which Dr. Ross accounts for in the following manner. 'But much in the same way that high temperature and fœtor—plus a special poison—engender zymotic diseases, cold and draught induce pulmonary affections.' 'I have no doubt that this heavy mortality from pulmonary affections is largely caused by the ill-constructed dwellings of the poor, and by the water-logged soil that constitutes their foundations. The windows, moreover, are constantly broken, the walls damp, and roofs leaky, letting in rain and wind on the occupants.' 'The intemperate habits of the poor, too, lay them open to attacks of bronchitis, for it no uncommon thing for a man or a woman to come home intoxicated, and to lie down in wet clothes on the floor, either of the room or staircase. They are thus exposed to the draughts which blow through the house, and waking up in the morning with a shiver, find they have caught cold, in other words, have an attack of pneumonia or bronchitis. The erection of proper dwellings on a dry soil will prevent much of this.'

The sanitary work performed was, as might have been expected, rather large, as there were 4,850 sanitary improvements effected in 1,235 houses. There were 85 disinfections performed, which included 801 articles, 61 cases of over-crowding abated, 952 houses cleansed and whitewashed, and only 18 summonses taken out. Considering the reputation which St. Giles's has always had for overcrowding and for the use of underground rooms, it is satisfactory to find that the inspector, 'whenever he had cause to interfere, found no difficulty in getting the underground rooms vacated without having recourse to legal proceedings.'

IN the Queen's Bench, Mr. Gorst, Q.C., on behalf of the Local Government Board, has applied for a rule calling on the Corporation of Lincoln to show cause why a mandamus should not issue commanding them, as the local sanitary authority, to supply the district with a system of main drainage. A rule was granted.

Law Reports.

POWERS OF ENTRY.

AT a meeting of the Runcorn Sanitary Authority, Mr. Edwards asked the clerk whether a sanitary officer had power, without a magistrate's warrant, to enter any habitation, without the permission of the tenant, to make an inspection. The clerk quoted the 102nd section of the Public Health Act, the effect of which was that if the occupier refused to give his permission for his premises to be inspected, the sanitary officer could not enter without having obtained a warrant from a magistrate to do so, notice having been given to the occupier of the intended application for such warrant. Mr. Edwards expressed himself satisfied, and said that an Englishman's house was still his castle.

DEFINITION OF 'OFFENSIVE TRADE.'

IN the Queen's Bench on November 12 was heard the case of *Cardell* v. *Newquay Local Board*.—The appellant, a manure merchant, had opened stores for materials for the making of manure against the remonstrances of the local board of Newquay, in the front street in the centre of their district. The ground on which the local board obtained the summons was that the appellant had newly established a noxious or offensive trade, without their consent, in contravention of the Public Health Act. For the local board it was argued that, from a common sense point of view, the trade of a manure merchant, with all the varieties of guano and other artificial manures, must necessarily be offensive when carried on in close proximity to the inhabitants. The magistrates, having taken that view, convicted the defendant.—The court thought that they could not say, as a matter of law, that the business of a manure merchant, so far as appeared in the case, was necessarily noxious or offensive within the meaning of the Public Health Act, and they, therefore, quashed the conviction.

NON-DEPOSIT OF PLANS AS TO BUILDINGS.

AT the Bromley (Kent) sessions, B. Jones, a builder, has been summoned, at the instance of the local board, for an infringement of by-law 29; the defendant having commenced to build a house without having first deposited a notice, plans, and sections.—The clerk stated that, as this case was one of a very bad type, the defendant having wilfully omitted to furnish the plans, etc., he was instructed to ask for the penalty of 5*l*.—The surveyor stated that, in September last, the defendant showed him an incomplete plan of a proposed dwelling-house, and inquired whether the same was in conformity with the by-laws, and was informed that it would require amendment in certain particulars as to ventilation, etc., which were pointed out, and also that a block plan would be required. The surveyor subsequently met the defendant, who told him he should go on with the building and 'risk it,' and on October 5 he inspected the site, and found the house had been commenced. A notice was then sent to the defendant requiring him to deposit plans, but this notice had not been complied with. Little progress, however, had been made with the building; and, having regard to this fact, the justices took a lenient view of the case, and ordered the defendant to pay the mitigated penalty of 5*l*. and costs.

NON-PAYMENT OF SUM CERTIFIED BY AUDITOR.

AT the Cardigan petty sessions Mr. E. Jones, poor law auditor, appeared to support a summons against the late overseers of Llechrydd for non-payment of a sum of 46*l*. 6*s*. 1½*d*., certified by him to be due from them at the Lady-day audit, 1875. Mr. Evans, solicitor, appeared for the defendants. Mr. Jones stated that he had written to the overseers twice requesting payment, but had received no reply; consequently he had taken proceedings. He should contend that if certain things required by the statute 11 and 12 Vict., c. 91, were proved by him, the justices would be obliged to give judgment in his favour—that, in fact, they could not enter into the question whether he was right or wrong in certifying the sum sought to be recovered. He admitted that this looked like an injustice, but it really was not so, as it was competent for the defendants to have removed the question of the sum certified to the Court of Queen's Bench, or to have appealed to the Local Government Board. As they had adopted neither of these courses, the justices had simply a ministerial act to perform, and must convict. Mr. Jones produced his appointment under the Poor Law Board, and the book of accounts in which the certificate was entered, and also a certificate under the hand of the treasurer of the union, setting forth that the sum certified had not been paid to him. Mr. Evans then proceeded to cross-examine the auditor, and asked certain questions as to certain items; but Mr. Jones declined to answer. The magistrates deliberated for some time in private as to the point raised by the auditor, and announced that they were unanimously of opinion that it was not competent for them to enter into the question whether the auditor had acted properly in certifying as he had. Mr. Evans then urged that the certificate was not in the prescribed form. This objection was also overruled; and in the end the defendants were ordered to pay the sum certified, and in default of payment were sentenced to two months' imprisonment. Mr. Evans intimated his intention to carry the matter to the Local Government Board or Court of Queen's Bench.

SURVEYORS' FEES FOR CHIMNEY-POTS.

AT the Marylebone Police Court, H. Faulkner, 57 Jermyn Street, was summoned for 1*l*. 15*s*. surveyor's fees. The facts appeared to be that a chimney-pot, or 'tall-boy,' as it is technically termed, was blown down, and it became necessary to replace it by a new one. This having been seen from the street by the district surveyor, he sent his claim for fees.—Mr. Alsop, for the defence, elicited from the surveyor that he had never been on the roof of the house, and that he had received no notice from the builder. Mr. Alsop submitted that, first, the surveyor could not recover, as it was not 'surveying' merely to look at a chimney-pot from the street; and, secondly, that the surveyor had not proved any delivery of a bill in pursuance of the Act 18 & 19 Vict., cap. 122, sec. 51.—Mr. Newton was of opinion that the proper course was for the surveyor to go upon the roof.—Mr. Alsop said there was a third objection, that the work done was within the 9th section of the Act, which specially exempted necessary repair not affecting the construction of any external or party wall, and he argued that it could not be said that the mere replacing of a blown-down chimney-pot affected the construction of a party-wall.—Mr. Newton said it was monstrous that a fee of 1*l*. 15*s*. should be charged by a district surveyor for merely looking at a new 'tall boy' from the street. The proper way—if at all—was for the district surveyor to have gone on the roof and made an inspection, but he was sure that such work did not and never was intended to come within the meaning of the Act or to be charged for by district surveyors. He should dismiss the summons. With respect to this case the district surveyor writes:—'I beg leave to say that it conveys an erroneous idea of the case, which is not an uninteresting one perhaps to some of the public. The issue was this—whether the erection of those lofty and somewhat menacing chimney tubes of metal which are now becoming so common in certain parts of the town is to be controlled or not by the public surveyor of buildings. The proposition "that a fee of 1*l*. 15*s*. should be charged by a district surveyor for merely looking at a new 'tall boy' from the street" is of course absurd; the fee actually asked for in order to raise the question was 5*s*., as an abatement of the Parliamentary fee which goes by the size of the house. The

learned magistrate held that no fee is payable—that is, that the public officer has no control. For my own part I am quite content to be relieved of the responsibility, but still I fear this decision does not so relieve me.'

COUNTY COURT PROCEEDINGS RESPECTING BY-LAWS.

THE Wellington local board have instituted proceedings in the county court against a Mr. Elworthy to recover a penalty for breach of by-laws. Mr. Elworthy has been altering his house, and making additions; and as he had given no notice of his intention to build, and had not furnished plans, the local board sued him. When the case came before the judge, the chief argument of the defendant was that, the buildings not being in a 'street,' he was not obliged to submit plans, and that a penalty could not be recovered in the county court. The judgment by Serjeant Petersdorf was as follows:—'The section 24 of 24 & 25 Vict., c. 60, confers upon the Courts jurisdiction for recovery of a demand of the character sought to be enforced by the local board. The action was brought to recover 20*l.*, the plaintiffs' demand against the defendant for having commenced the erection of a new building within their district without giving notice to the board of his intention to build, and for not supplying detailed plans of such erection or structure, with a description of materials, etc. The summons was originally for 20*l.*, but reduced by amendment below that sum, to bring the case within the terms of the act referred to, giving jurisdiction to county courts for the recovery of such claims. There is no ground for impeaching the legality of the by-laws upon which the proceedings have been taken by the board. The question submitted to the court involves an inquiry as to law and fact—that is, whether the defendant has infringed the 26th rule of the local board. The premises of Mr. Elworthy are indisputably in this board's district. The question submitted to the court is whether it was obligatory on the defendant to give written notice of his intention to erect the building now in course of construction, and leave at the office of the surveyor detailed plans and sections as required by the by-laws, upon which the proceedings are founded. The inquiry is not whether the whole contemplated buildings are new within the meaning of the 26th clause, but whether any of the buildings in progress are new. The extent and description of the buildings are immaterial, if any is new. The result of the evidence, and a careful inspection of the premises, prevents my doubting that some new building is intended, and is in course of construction, coming within the 26th by-law.—Judgment is for 1*s.*, with costs against the defendant.

BUILDING BY-LAWS.

THE question has been mooted as to whether the local board should retain plans of new buildings submitted to them for approval in accordance with the by-laws. Our practice has been to retain all plans. Will you give your opinion? The by-laws require that a person intending to make or lay out any new street shall give notice to the local board of such intention by writing, delivered to the surveyor or left at his office, and shall at the same time leave or cause to be left at the said office a plan and section of such intended new street. Also, that a person intending to erect any new building shall leave or cause to be left at the office of the surveyor detail plans and sections of every floor of such intended new building.

[The general, we had almost said universal, practice, is that plans deposited with a local board for approval are supposed to be retained by the board for future reference. And the advantages of this are self-evident. We cannot recommend any departure from this arrangement.]

COMPENSATION BY LOCAL AUTHORITIES.

THE rural sanitary authority of the L. Union intend to supply the inhabitants of R. with water from a pasture called Brooklands.

It is a natural stream of water, which first makes its appearance on the side of a large hill, and flows in a channel through the said pasture called Brooklands and under a highway (turnpike).

The sanitary authority intend to place under this highway a tank or cistern to receive the running stream of water and allow the overflow to take its usual course.

A many years ago the Commissioners of this Turnpike Trust purchased sufficient land from the adjoining owners for the purpose of making this road, and had it fenced off.

The question now raised is one of rights of owner to compensation.

Under the circumstances stated, can the owner of the adjoining land, opposite the point where it is proposed to take water, legally claim compensation.

I may add that the Turnpike Trust expired about three years ago, and the duty of repairing the road is vested in a highway board whose consent to what the authority intend to do has been obtained thereto.

UNION CLERK.

[The facts in this case are not stated with sufficient fulness to enable us to offer a confident opinion, but on the whole we think that the compensation clause (308) of the 'Public Health Act, 1875,' does apply, and that the Local Authority may be required to make compensation.]

WHAT IS A COMMON LODGING-HOUSE.

MUCH difficulty is often felt in dealing with the question, 'What is a common lodging-house?' under section 89 of the Public Health Act, 1875. As we have already stated in these columns, no statutory definition available for sanitary authorities generally exists, but a case was submitted to Sir A. Cockburn and Lord Hatherley, when law officers of the Crown, as to the definition of the expression 'common lodging-house,' and it may be convenient to publish their opinion. The first opinion was as follows: 'It may be difficult to give a precise definition of the term "common lodging-house;" but looking to the preamble and general provisions of the Act, it appears to us to have reference to that class of lodging-houses in which persons of the poorer class are received for short periods, and, though strangers to one another, are allowed to inhabit one common room. We are of opinion that it does not include hotels, inns, public-houses, or lodgings let to the upper and middle classes.' In a second opinion they stated: 'The points upon which our opinion is desired appear to us to be the following. 1. What is the meaning of that part of the definition of a common lodging-house in our former opinion which refers to the parties inhabiting a common room being "strangers to one another"? The observation made would imply that we meant that the parties must be persons previously unacquainted one with another. Our obvious intention was to distinguish lodgers promiscuously brought together from members of one family or household. 2. Whether lodging-houses, otherwise coming within the definition, but let for a week or longer period, would, from the latter circumstance, be excluded from the operation of the Act? We are of opinion that the period of letting is unimportant in determining whether a lodging-house comes under the act now in question. 3. Who is to be considered the keeper of a common lodging-house where the owner, letting the lodgings, does not himself reside in the house? We are of opinion that where he neither resides in the house, nor exercises any control over its management, but simply receives the rent, he cannot be considered the keeper. It is clear that in such case he could not comply with the requirements of sections 11, 12, and 13 of the Act. But where the owner, though not resident in the house, either in person or through an agent, colourably or otherwise exercises control over its management, we have no doubt that he should be considered the keeper. A serious difficulty arises where the owner *bonâ fide* lets different parts of the house to different individuals, and these lessees take in lodgers of such a description as would in an

ordinary case constitute the house a common lodging-house. The question which here arises is, Whether each apartment so used is to be considered a common lodging-house, of which the lessee is the keeper? It seems to us difficult to suppose that the Act which refers to common lodging-houses was intended to apply to single apartments, so that every room in a house might become a separate common lodging-house. On the other hand, it is to be observed that it is by section 2 provided that part of a house, "if used as a common lodging-house," shall be included in the Act; and it is also true that both under the law relating to burglary, and also with reference to the exercise of franchises, the separate apartments of lodgers, where the landlord did not reside, have been held to be dwelling-houses. Considering, therefore, that apartments thus let and occupied are especially within the mischief intended to be remedied by the Act, we think that an attempt should be made to treat them as common lodging-houses, and to enforce the provisions of the Act with respect to them against the tenants who thus admit lodgers. At the same time, we feel bound to say we entertain considerable doubts as to the result.' The foregoing is almost the only good material which we can offer our readers to help them in the elucidation of this difficult matter.

POWERS AS TO DISINFECTION.

SIR,—The Rural Sanitary Authority of this Union has passed the following resolution: 'That in every case where the disinfecting of a house or premises becomes necessary, and the occupier from poverty or otherwise is unable to do so, notice be served on the owner to disinfect the same in accordance with section 120, Public Health Act, 1875.' In case the owner neglects to disinfect, and it is done by the authority, can the expenses of so doing be recovered from the owner?

Westbury-on-Trym, Bristol, November 26, 1875. W. M. LOWICK.

[The above question raises a point of considerable difficulty, which nothing short of a decision in a superior court can settle. There is great force in the argument that the local authority has an option of proceeding either against the landlord or the tenant, and in one sense this is a fair construction of the words used. Nevertheless, we greatly doubt whether it was the intention of the Legislature that a landlord should be liable for the disinfection of the mere personal effects of his tenant. If the local authority can find it practically possible to adhere to the strict letter of its own resolution, and confine the burden which it may seek to put on any landlord simply to the disinfection of the fabric of a house (including landlord's fixtures), it might suffice; and so much of the expenses as appertain to the fabric might perhaps be recoverable from such landlord. We do not, however, feel at all confident that a court would decide in accordance with this view. We can quite understand that the subject is one of great importance in a large urban district, and, therefore, we think that our correspondent's board had better get its local facts carefully set out in detail and take the opinion of counsel before taking proceedings to enforce its resolution before a bench of magistrates.]

QUALIFICATIONS OF MEMBERS OF LOCAL BOARDS.

SIR,—May I trouble you for replies, in your next issue, to the following queries? Our local board was established under the Public Health Act of 1848, and consists of nine members. The chairman is sole proprietor of the gasworks, and cheques in payment of the gas which lights the town lamps are made in his name; a second is an auctioneer, and last week sold the town dung; a third member, having special knowledge of the geological features of the district, has been employed by the board to make a detailed report on the water-supply, for which he is to be paid; a fourth member is said to have sold the board a water-cart. *a.* Does paragraph sixty-four, schedule 2, of the Public Health Act of last session (38 & 39 Vict. cap. 55), apply to these four gentlemen, or any one of them? *b.* Supposing that it does apply, have the resolutions for which they voted since they became disqualified any legal value? *c.* The board is about to appoint a medical officer of health. Are these gentlemen entitled to vote on the question in any of its bearings, as, for example, duration of appointment, or salary?

Apologising for this letter, but trusting that it contains material applicable to other boards, and therefore of public importance. MEDICUS.

[*a.* Undoubtedly the enactment cited applies to all the four members alluded to.

b. and *c.* These are questions of some difficulty. We cannot find any recent decisions strictly in point, but the cases of *Reg.* v. *Griffiths* and *Rex.* v. *Bedford Level Corporation*, cited in Chambers's *Digest*, title 'Appointment of Officers,' seem to show that an appointment made by parties, some of whom are not entitled to join in the appointment, may be upset, though in the same work one or two cases are mentioned in which, though the proceedings were, strictly speaking, invalid, yet the court refused to interfere because no very serious public inconvenience was shown to have arisen. We take it to be quite clear that such of the four members alluded to in the question put by 'Medicus,' as have received directly or indirectly any of the public money of the board to which they belonged, have by so doing vacated their seats, and are no longer in office, and, therefore, are not competent to deal with the matter mentioned in *c.*, or with any other local board matter.]

REMOVAL OF NUISANCES IN RURAL DISTRICTS.

SIR,—Five persons were lately charged by the Nuisance Inspector for the Tamworth Rural Sanitary Authority with allowing foul privies and ash pits to exist on their premises (at Annington) dangerous to health. As the nuisance was removed before the case was heard, the bench dismissed them on defendants paying the costs, 4*s.* 6*d.* each, at the same time remarking that it rested with the tenants to remove the nuisances, and not the inspector or the landlord. There are many cases of this kind in the neighbourhood, in which, if the poor people are compelled to remove this refuse, having no land on which to put it, or any means to cart it away, we may naturally expect that they will be imposed upon by having to pay very heavily for the execution of such work. Many people are under the impression that the new Public Health Act, 1875, provides every means of removing such nuisances, which are to be paid for by the rural or urban sanitary authority, as the case may be. I should, therefore, feel obliged if you would please inform me in your next impression whether any law exists to compel the rural or urban authority to remove such nuisances?

Section 42 of the Public Health Act, 1875, reads, 'Every local authority may, and when required by order of the Local Government Board, shall themselves undertake to contract for the removal of house refuse from premises.' Section 43 states, 'If a local authority, who have themselves undertaken or contracted for the removal of house refuse, or the cleansing of earth closets, privies, ashpits, and cesspools, fail, without reasonable excuse, after notice in writing to remove such nuisances within seven days, the local authority shall be liable to pay to the occupier of such house a penalty nor exceeding 5*s.* for every day such default continues after the expiration of that period.'

The *Globe*, a short time ago, in referring to the Sanitary Law Amendment Act, 1874, said, the public would feel more cause for gladness in section 21 of that Act, which requires every urban sanitary authority to make due provision for the proper cleansing of streets, removal of household refuse from premises, and cleansing of earth-

closets, ashpits, etc., within their districts; and in the event of such authority failing to perform the work for seven days, a fine of 5*s*. a day would be incurred. The *Globe* continues to say, many people might think that seven days was too long and 5*s*. too small a fine seeing the evils resulting from negligence; and yet these poor people have had to pay for not removing the refuse themselves.

S. BARACLOUGH,
Inspector of Nuisances for the
Borough of Tamworth.

Tamworth, November 20, 1875.

[Our correspondent virtually solves the difficulties he himself has raised. Speaking generally the position of affairs under the Public Health Act (see especially sections 91, 94, and 97) is simply this: If a nuisance exists it must be removed. If the circumstances of the locality are such as to require that the local authority should make provision for scavenging and the removal of house-refuse, they ought to do so. The law as to all these matters is set forth with great plainness in the 'Public Health Act, 1875,' and we will only add that, apparently, the cottagers mentioned in the above letter were liable to be fined if the nuisances alleged against them had continued.]

Correspondence.

THE PROPER FOOD OF MAN.

I.

The Food of the Masses.

(*To the Editor of the* SANITARY RECORD.)

SIR,—The food, fuel, and clothing questions are prominent topics of our day, and nowhere can they be more appropriately discussed than in the SANITARY RECORD. Food, fuel, and clothing are the indispensables of health, even should we not completely adopt Richard Cobden's axiom that—'without a full belly there is no religion, and without a whole pair of breeches no morality.'

At any rate, the food question is uppermost. It is certain that the thirty-two millions of our population are, in the main, under fed. The seventy millions of pounds sterling annually expended by Great Britain upon flesh-meat answer mainly for the sustentation of the upper twelve millions of the population; whilst the remaining twenty millions depend mostly—in many instances, entirely—on farinaceous and vegetable matter for keeping body and soul together.

This assertion is incontestable. Mr. Beeton's *Penny Cookery Book* demonstrates the fact with the utmost precision. This admirable little book undertakes to show the poor man—throughout the above twenty millions of our population—what he can do, or rather, all that he can do, towards filling the bellies of himself, his wife, and four children (the stereotyped British family of six) upon earnings of 10*s*., 15*s*., 20*s*., 25*s*., 30*s*., and 40*s*. per week—the last earnings being the limit between the upper twelve millions who can feast on flesh-meat every day, and the lower twenty millions who must be content with only 'the crumbs' of it that fall from the rich man's table.

Now, just let us glance at the weekly bill of fare conscientiously and considerately drawn up by Mr. Beeton, as the *ne plus ultrà* of dietary.

The following table gives the sum that can be afforded per day for the sustenance of the family, by the respective earners above mentioned.

Per week earnings		Per day for six			
10 shillings	afford	10*d*.	equal to	1½*d*.	each
15 ,,	,,	1*s*. 3*d*.	,,	2*d*.	,,
20 ,,	,,	1*s*. 8*d*.	,,	3*d*.	,,
25 ,,	,,	2*s*.	,,	3½*d*.	,,
30 ,,	,,	2*s*. 4*d*.	,,	4*d*.	,,
40 ,,	,,	2*s*. 10*d*.	,,	5*d*.	,,

Hence we have it that the *daily expenditure* of each member of these six representative families, amounts to about 1½*d*., 2*d*., 3*d*., 3½*d*., 4*d*., and 5*d*.; and the serious question is—what manner of sustentation can be got out of 1½*d*., 2*d*., 3*d*. etc. Well, Mr. Beeton shows that it *can* be managed, but only with the grand substratum of two and a half stone of flour per week, to be variously utilised by the family. The bills of fare of the respective families as they advance in earnings, are excellent (to read), but vegetable and farinaceous matter largely preponderate as a matter of course—oatmeal, potato stew, dumplings, colecannon (potatoes and cabbage), gourd-pudding, porridge—with a scant allowance of cold bacon and sausage dumpling, rising successively to stewed tripe, sheep's-head, beef-soup, ox-cheek soup, fish pie, mutton broth, 'Brazilian stew,' pork pancakes, hodge-podge, toad-in-hole, rabbit stew—until at length the family with 40*s*. per week can feast its eyes and stomachs with four pounds of beef (baked), potatoes, horseradish sauce, and rice, for a Sunday dinner.

It is to be observed that out of this fivepence per day, down to the penny-farthing a day, Mr. Beeton provides breakfast and supper, as well as dinner—all the items being duly set forth for each day of the week, with considerable variations. This admirable economy of food reminds us of Sydney Smith's expostulation to Lord Murray: 'If you wish for anything like happiness in the fifth act of life, eat and drink about one-half what you *could* eat and drink. Did I ever tell you my calculation about eating and drinking? Having ascertained the weight of what I could live upon, so as to preserve health and strength, and what I *did* live upon, I found that between ten and seventy years of age, I had eaten and drunk forty-four horse-waggon loads of meat and drink more than would have preserved me in life and health! The value of this mass of nourishment I considered to be worth seven thousand pounds sterling! It occurred to me that I must, by my voracity, have starved to death fully a hundred persons. This is a frightful calculation, but irresistibly true; and I think, dear Murray, *your* waggons would require an additional horse, eh?'

Assuredly, the majority of our population are vegetarians in the main—compulsory, if you like, but still the above facts and figures demonstrate that vegetable and farinaceous matter produce the strength of our people. And I have no hesitation in saying that, if an intelligent and dutiful housewife were to conform to Mr. Beeton's directions, the daily fare for each of the above families would be very far from being deficient but, on the contrary, rather good and savoury. Anyone may try the experiment, and judge for himself, as to the possibility of living upon sums ranging from 1½*d*. up to the luxurious 5*d*. per day.

If that be the case—or even should it not be the case—nothing is more certain than that the upper twelve millions eat too much flesh meat, since they consume more than nineteen-twentieths of the seventy-millions' worth of flesh meat consumed in the United Kingdom, without being a jot stronger or healthier than their inferiors, who 'are obliged to put up with what they can get,' chiefly vegetable and farinaceous matter. I need not trouble you with the statistics of disease and mortality to uphold this averment. All the best medical authorities, moreover, concur in the opinion that over-feeding on flesh-meat is the fruitful source of disease among the upper classes, or rather, among all who can indulge their appetites to the utmost.

Mr. W. J. Cooper, in the Health Department of the Social Science Congress at Brighton, was most explicit on this important item of national infatuation. He said:

'Too much meat is eaten in this country, and the cattle disease and the increasing price of meat may prove a positive benefit, if it should prevent some people from eating more than is good for them. Excess of nitrogenous food is believed to be the cause of many of the diseases of the kidneys, which are so prevalent in England. As nitrogen is excreted by the kidneys, those organs, if overworked, will in time degenerate, and not being able to perform their proper functions, their work is thrown upon

the other excretory organs, and if they fail, blood-poisoning takes place, and the victim of an excessive nitrogenous diet is killed—as if by an overdose of a narcotic!'

Such, then, is the position of the food question; and, with your permission, I propose to discuss in its entirety this most important topic, strictly on scientific grounds—and demonstrate that the proper food of man is to be derived from the vegetable, and not from the animal, kingdom.

VEGETARIUS.

THE SPREAD OF INFECTIOUS DISEASES.

(*To the Editor of the* SANITARY RECORD.)

SIR,—During the past week both the Rural and Urban Authorities of Taunton have adopted the memorial of the Bridge Union Sanitary Authority, with this alteration—they have omitted the word 'contagious.' As this term may include more than the petitioners intend, and as the word 'infectious' is sufficiently expressive, I think the omission a wise one. I would suggest that all medical officers of health should urge upon their respective authorities the great importance of adopting the memorial. The value of such enactments in diminishing the spread of infectious disease would be immense. How many a fatal outbreak might be cut short did we but hear of the *first* case as soon as diagnosed!

HENRY J. ALFORD, M.D.,
Medical Officer of Health, Taunton District.

Dec. 8, 1875.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

BENNETT, James Heaton, M.D. Univ. Edin., M.R.C.S. Eng., L.S.A. Lond., has been re-appointed Medical Officer of Health for the Redcar Urban Sanitary District: 15*l.* per annum.

BUGLER, John Udal, Esq., has been appointed Chairman of the Ashford Local Board and Urban Sanitary Authority.

CATTELL, Mr. Robert V., has been re-appointed Inspector of Nuisances for the Risbridge and Linton Rural Sanitary Districts.

FIELDEN, John, Esq., has been appointed Chairman of the Todmorden Urban Sanitary Authority for the ensuing year.

HALL, John, L.F.P.S. Glasg., L.S.A. Lond., has been appointed Medical Officer of Health for the Leigh Urban Sanitary District.

HAWDON, Mr. Michael, has been appointed Surveyor and Inspector of Nuisances for the Blaydon-on-Tyne Urban Sanitary District.

JACKSON, Mr. John Alfred Petty, has been appointed Building and Road Surveyor, Inspector of Nuisances, Rating Clerk, and Collector, to the Newington, Yorkshire, Urban Sanitary Authority.

LLOYD, William, M.B. Univ. Dub., M.R.C.S. Eng., L.S.A. Lond., has been appointed Medical Officer of Health for the Carmarthen Sub-district of the Carmarthen Rural Sanitary District, vice David Lloyd, M.R.C.S. Eng., L.S.A. Lond., deceased.

MACDONALD, Mr. James, has been appointed Surveyor to the Sevenoaks Urban Sanitary Authority, vice Blackman, resigned.

VACANCIES.

BURSLEM URBAN SANITARY DISTRICT. Inspector of Nuisances: 80*l.* per annum. Application, 24th instant, to J. W. Powell, Clerk of the Authority.

NUNEATON URBAN SANITARY DISTRICT. Surveyor and Inspector of Nuisances: 100*l.* per annum. Application, 18th instant, to John Estlin, Clerk to the Authority.

PENARTH, GLAMORGANSHIRE, URBAN SANITARY AUTHORITY. Clerk: 40*l.* per annum. Application, 13th instant, to W. P. Stephenson, Clerk *pro tem.* to the Authority.

PENISTONE, YORKSHIRE. Medical Officer of Health for part of the Penistone Rural Sanitary District, combined with the Penistone Urban Sanitary District: 24*l.* per annum. Medical Officer of Health for other part of the Penistone Rural Sanitary District, combined with the Clayton West, and Gunthwaite and Ingbirchworth Urban Sanitary Districts: 21*l.* per annum. Inspector of Nuisances for the Penistone Rural, combined with the Clayton West, and Gunthwaite and Ingbirchworth Urban Sanitary Districts: 56*l.* per annum. Application, 16th instant, to John Dyson, Chairman of the Penistone Rural Sanitary Authority.

STOKE-ON-TRENT URBAN SANITARY DISTRICT. Inspector of Nuisances: 100*l.* per annum. Application. 13th instant, to William Bagnall, Town Clerk.

SWADLINCOTE URBAN SANITARY DISTRICT. Medical Officer of Health.

WARRINGTON. Certifying Factory Surgeon.

WORKINGTON URBAN SANITARY DISTRICT. Medical Officer of Health.

WORKSOP URBAN SANITARY DISTRICT. Surveyor. Application, 11th instant, to John Appleton, Clerk to the Authority.

SANITARY PATENTS.

3699. Improvements relating to the action of atmospheric air for preventing the waste or loss of heat in processes and apparatus wherein heat is generated or utilised, and for preventing the entrance of heat into apparatus used for refrigerating or similar purposes. Edwin Maw, Liverpool.

3701. Improvements in apparatus for enabling persons safely to enter places filled with smoke, and in lanterns for lighting such places. Edward Griffith Brewer, Chancery Lane, London. A communication from Bernard Loeb, Giessen, Germany.

3703. Improvements in the treatment or purification of sewage and other matters, and in the treatment or preparation of agents to be used in the said purification. Christopher Rawson, Victoria Chambers, Westminster, and John William Slater, Tamworth Terrace, London.

3729. Improvements in preserving meat, and in apparatus therefor. Peter Jensen, Chancery Lane, London. A communication from Theodor Achtelstetter, Nüremberg, Bavaria, and Sigismund von Sawiczewsky, Vienna, Austria.

ABSTRACTS OF SPECIFICATIONS.

1369. Hydrocarbon cooking-stoves. D. P. Wright, Birmingham.

This invention of improvements in petroleum or hydrocarbon cooking-stoves has for object the facilitating the lighting, trimming, and cleaning, and rendering the management of these stoves more easy and certain than heretofore.

1376. Biscuits. J. Curlender, Salisbury Street.

A novel mode of combining concentrated 'meat paste,' meat extracts, 'Liebig's extract of meat,' and such and such like preparations resulting from the treatment of animal flesh by such and such like methods of extracting and concentrating the useful qualities of 'carnous' or animal matter, so as to convey the nutrition and nutritive qualities for which the associated farinaceous or other matter is to form a vehicle, and by means of this process enable it to be administered in regulated quantities in an unsophisticated condition associated with farinaceous matter. In every case the nutritive 'meat extract' is protected from the oxidising and deteriorating action of the atmosphere by an envelope or coating applied as described either to the particles or portions, or to the layers or sandwich-like arrangement of the nutritive extract by which it is preserved in a concentrated or associated condition.

1335. Sewage. W. Morgan Brown, Southampton Buildings.

This invention describes the extracting fertilising products from sewage, by allowing the liquid to flow in wide and shallow currents over any slightly inclined surface; the tendency of this arrangement is to cause a rapid settlement of the solid matter, which is removed or dried in currents of air.

1371. Slaughtering oxen. H. C. Mayer, Pall Mall.

The instrument substantially consists of a tube or cylinder provided with a spring, to which tube or cylinder another tube or cylinder is fitted free to slide up and down therein, and such second tube or cylinder is provided at the top with a head. A spindle is attached to the head of the instrument having the lower part as a blade furnished with a cutting edge, by preference of a diamond shape, said spindle and blade working inside said tubes or cylinders, and when applied to the animal, is fitted by band attached to lower cylinder or tube over that part of the spine termed medulla oblongata. The head of the instrument when so fitted is struck, and the blade enters the neck of the animal, dividing the medulla, and thereby causing instant and almost painless death. A blinder may be also used to screen the eyes of the animal.

1484. Manure. J. H. Johnson, Lincoln's Inn Fields.

This invention relates to the manufacture of soluble and putrescible manure from new products obtained by the special treatment of nitrogenous substances, such for example as leather, wool, and horn, which in their natural condition are insoluble and imputrescible, and also to apparatus to be employed in operation upon the before-mentioned substances.

1485. Preserving life. A. W. Pike, Kennington Lane.

This invention relates to apparatus intended more particularly for use on board ships, and which whilst serving as a mattress may be utilised in the case of an emergency for the preservation of life and property afloat. The apparatus may also be utilised for other purposes for which punts or boats are ordinarily employed.

1499. Ventilating drains. W. P. Buchan, Glasgow.

This invention consists in forming a small lateral branch on the vertical inlet duct of the ordinary syphon trap, and rather higher than the level of the water in the trap. This lateral branch has an inlet air-pipe which allows fresh air to pass down the same and up the soil-pipe and through the ventilating-pipes of these to the roof. Also in making the inlet duct of the syphon nearly vertical, and with a tongue between the bends dipping below the overflow, the lower inlet end of the drain entering right into the vertical duct a little higher than the outlet. The air inlet of the duct is fitted with a perforated plate, and another plate is fitted below at the throat to prevent entrance of rats, and the space between these is filled with charcoal. Also in forming the trap in the shape of a small well with the drain leading in near the top on the one side, and the overflow branch and duct placed a little lower on the other hand, and with a perforated air inlet-plate and throat at the top, separated from the outlet branch by a dipping tongue so as to allow the air to pass freely in.

1486. Prevention of the slipping of horses. C. Myring, Walsall.

This invention consists of a receptacle for ashes or gritty substance or other mixtures to be conveyed to the feet of horses whilst in motion, and in such a way as to be under the control of the driver.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer —not necessarily for publication.

DISINFECTANTS.

(*To the Editor of the* SANITARY RECORD.)

SIR,—Will you kindly inform me in your next issue of the SANITARY RECORD, the best mode of, and the disinfectants used in, disinfecting cabs used for conveying persons suffering from contagious diseases? Also, the mode and disinfectants used for fumigating the clothes of people suffering from contagious diseases? Could you also tell me the most certain and expeditious way for freeing old clothes from pediculi? AN INQUIRER.

[1. The best method of disinfecting cabs is to burn one ounce of sulphur inside the cab, the doors and windows being closely shut, and the loose cushions stood on end. 2. The clothes should be disinfected with sulphurous acid as in the last case, except that, if the sulphur be burnt in an ordinary room, about four ounces of sulphur should be used; but, if possible, the clothes should be placed in a chamber of small size, or large box, heated by gas or fire, and exposed to a temperature of from 230° to 250° Fahr. as well as to sulphur fumes. 3. Exposure to heat as above, with, or without, the addition of sulphur. Of course nothing which will bleach must be exposed to sulphurous acid gas, unless the owners are first told that the colour of the article will probably be destroyed.—ED.]

THE EUCALYPTUS GLOBULUS.

THE experiment of planting this tree in the unhealthy Campagna of Rome, with the object of destroying the influence of the miasmatic exhalations from the ground, has been tried for several years, particularly in the locality of the Monastery of St. Paul Trois Fontaines, where a priest named Gildas has had the plants under cultivation. In some communications addressed to the Société d'Acclimatation de Paris, M. Gildas states that the trees have thriven, and that he believes they have given indications of their power in arresting disease, though as yet they are not sufficiently numerous to produce much effect.

A SYSTEMATIC SANITARY SURVEY.

AT the meeting of the American Public Health Association, in session at Baltimore, Dr. John S. Billings, assistant-surgeon, U. S. army, presented a report on the various attempts which have been made to obtain data for a comprehensive medical topography of the United States, on the causes of failure, and on the best means of obtaining them. The report was referred to the executive committee of the association, with instructions to appoint a special committee to carry into effect the plan for a systematic sanitary survey of the United States, the executive committee to memorialise Congress to detail a medical officer of the army, who, under the direction of the surgeon-general of the army, shall co-operate with said committee in the prosecution of its duty.

INFANT MORTALITY.

DR. DAVID DAVIES, in his report 'On the Sanitary Condition of the City and County of Bristol,' remarks that 'infant mortality, *i.e.* of children under one year of age, is very high, forming 27 per cent. of the total. Much of this is attributable to the utter disregard of parental responsibility by many, to poverty, to the neglect of infantile diseases, and, above all, to the improper feeding of young infants when deprived of breast milk. I do not think I am exceeding the duties of my office in pointing out to persons in charge of such children, that milk—the only proper food of young infants—may now be procured of an uniform character, and not readily subject to deleterious changes, in the form of preserved milk in sealed tins, as prepared by different companies. I know, from numerous observations, that infants can be most successfully reared on this alone, until over twelve months old. I feel assured that proper regard to this fact would materially lessen our mortality from infantile diarrhœa.'

THE STREETS OF PARIS IN THE EIGHTEENTH CENTURY.

M. LACROIX's new work on *France in the Eighteenth Century* contains the following descriptions of the streets at that time—a decidedly pre-Hausmannic period: 'The highway was not kept in better order than the houses adjoining it, being only repaired at rare intervals; it was, indeed, difficult to ascertain when the roadway wanted repair, concealed, as it nearly always was, beneath a layer of dung, rubbish, or thick mud. The drain in the middle of the streets to carry off the water from the houses formed a stagnant pool, which was stirred up by the carriage-wheels and horses' hoofs. Mercier (*Tableaux de Paris*) says:—"When it rains there is a wide stream, swollen by the outflow from the shoots, and over this a moveable bridge is laid. The man in charge of this construction lifts it up to let carriages pass, and expects to be paid a *liard* for his trouble. You will see this at the corner of the Rue Triquetonne any day after a heavy storm. If the plank which forms the bridge happens to break, foot-passengers must be carried across if they do not want to get their feet wet." There were high stone pillars, some of them hooped with iron to prevent the wheels from grating against the walls of the houses; and behind these the luckless pedestrians were often glad to take refuge.' A very graphic illustration in the same volume, after Garnier, 'Crossing the Gutter after a Storm,' shows a hatted and feathered young lady getting carried across the turbid stream, pick-a-back fashion, by a bare-legged man.

OUR FOUR-FOOTED FRIENDS.

THE will of Mrs. Elizabeth Balls, of Streatham, lately deceased, after leaving considerable legacies to the Cancer Hospital, the Institution for the Deaf and Dumb, Old Kent Road, the Blind Schools, Southwark, the Idiots' Asylum, Earlswood, St. Thomas's Hospital, and Guy's Hospital, directs that the cob mare and greyhound which were her late husband's, are not to be sold. The mare is to be kept in a comfortable, warm loose-box, as it has been kept since her husband's death, is not to do any work either in or out of harness, and its back is not to be crossed by any member of her late husband's family, but it is to be ridden by some person of light weight not more than four days in each week and not more than one hour in each day, at a walking pace. A sum of 65*l.* per annum is left for the support of the mare, and 5*l.* per annum for the keep and care of the greyhound.

TOUGHENED GLASS.

THE *Ingegneria Civile e le Arti Industriale* gives the following account of a series of experiments that were made recently at the Engineering School at Turin with M. de la Bastie's toughened glass. The plates of glass were supported on a frame 0·145×0·105, placed in a perfectly horizontal position. First experiment: A piece of ordinary untoughened glass three millimètres in thickness broke by a weight of 100 grammes being dropped upon it from a height of sixty centimètres. Another piece of common glass two and a half millimètres thick was broken with the same weight falling from a height of fifty centimètres. Second experiment: A piece of tempered glass two and a half millimètres in thickness was experimented upon with the following results:

Weight	Height of fall	Results
100 grammes	0·50	Resisted
—	0·75	—
—	1·50	—
—	2·00	—
—	2·50	—
—	3·00	Broken

Third experiment: Piece of tempered glass four millimètres in thickness, treated in same way, with same weight:

Height of fall	Results
3·00	Resisted
3·50	—
4·10	—
4·10	Broken

Fourth experiment, with piece of tempered glass four millimètres thick:—

Weight	Height of fall	Results
200 grammes	1·00	Resisted
—	1·50	—
—	2·00	—
—	2·50	—
—	3·00	—
—	3·50	—
500 grammes	1·00	—
—	1·25	—
—	1·50	—
—	1·75	—
—	2·00	Broken

Fifth experiment: A piece of glass two millimètres thick, eight centimètres in width, and supported only from ends, and 0·105 apart, resisted a weight of 100 grammes falling from a height of one metre, and broke when increased to 1·50. Another piece of glass thirty millimètres in width and 160 millimètres in length, placed on supports 145 millimètres apart, gave the following results with a weight of 100 grammes:—

Weight	Height of fall	Results
100 grammes	0·50	Resisted
—	0·75	—
—	1·00	—
—	1·50	—
—	2·00	Broken.

In each experiment it was found that the glass was not fractured, as would be the case with ordinary glass, but was reduced to fine and regular pieces, showing clearly that the glass, in the process of toughening, undergoes a complete change in its molecular structure. Several watch-glasses, thrown to a height of two or three mètres, fell on the brick pavement without breaking. Other experiments were made for the purpose of testing the resistance of toughened glass to the action of intense heat and to rapid variations of temperature. A glass cup was exposed to the direct action of several flames of gas, and after being heated to a high temperature, and plunged into a mass of snow, resisted perfectly this test.

EARTH TO EARTH.—The superiority of the London Necropolis (Woking Cemetery) has been specially recognised in the *Times*, and other leading journals, and it is admitted that here only can the burial of the dead be properly carried out. The Company is prepared to conduct Funerals without the intervention of the ordinary undertaker at any stage of the proceedings. Prospectus free.—Office, 2 Lancaster Place, Strand, W.C.

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Original Papers.

SANITARY REMARKS ON TRAPS AND SOIL-PIPES.

BY A. FERGUS, M.D.,

President of the Faculty of Physicians and Surgeons, Glasgow; Member of the Council of the National Association for the Promotion of Social Science, etc. etc.

FOR some years back, I have been investigating excremental pollution diseases; and, at the meeting of the British Medical Association at Birmingham, I exhibited decayed lead pipes, and brought forward evidence to prove that this decay was caused by sewer-gas. At present I shall merely indicate the chief points of this evidence.

1. The perforations were on the upper part of cross pipes, above the water-line, or on the sides of perpendicular pipes where no water could lodge.

2. Pipes open at the top to the air (ventilated) lasted longer than those which were closed; and

3. The analysis of the powdery matter from the inside of decayed pipes.

Assuming, then, as proved that it is sewer-gas, produced by the decomposition of organic matter, which occasions this perforation of pipes—and as the perforations are always on the house side of the trap, it follows that the gas must either be generated in the trap itself or get through the water by tension in the sewers, or by being absorbed at the sewer side of the water-trap, and discharged at the house side of it. I at once dismiss the idea that tension has much to do with it, as it is only an occasional occurrence, and could not produce a permanent result.

My impression is, that the cause must be one of pretty constant action, and that the following is the process going on without much cessation, namely—the sewer-air is absorbed by the water on the sewer side of the trap, and discharged from the house end of it.

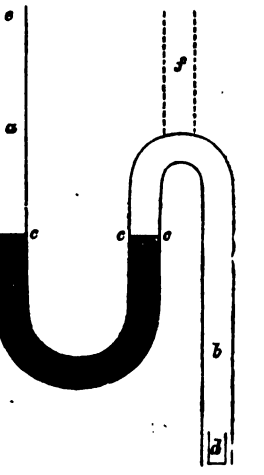
I have not hastily arrived at this conclusion; it has been forced on me as the only solution of all the facts of the case. If the destruction of good, well-made lead pipes is occasioned by sewer-air, and if this takes places in well-trapped house soil-pipes, we are shut up to one of three conclusions—(1) that the trap must be defective; (2) that decomposition goes on in the trap itself to such an extent as to produce sufficient vitiated air to perforate these pipes; or, (3) the conclusion at which I have arrived and have stated above—the passage of sewer-air through the water in the trap.

As regards the first point, I may say that the decayed pipes on the table were from houses where the drains were trapped between the house and the sewer. In one case I detected this state of pipes as a cause both of typhoid and diphtheria in an establishment where the party in charge specially congratulated himself on the security of his traps. He showed them to me with no little satisfaction. Yet in that very establishment, four years ago, it cost upwards of 100*l.* to renew the plumber work thus corroded; and I am happy to mention that there has not since then been a single case either of typhoid fever or diphtheria.

We are, therefore, ourselves very strongly inclined to believe the last alternative, namely—that however well drains may be trapped, sewer-gas will find its way from them into our houses; and any one who is acquainted with Graham's investigations as to the diffusion of gases will readily understand how this will happen.

The following experiments were made to show this.

A bent tube, such as the annexed was used, *a* representing house side of trap or soil pipe; *b* sewer side of same pipe; *c c*, *c c* level of water in trap; *d* small vessel or test tube, from which the gas was evolved; *e* position of the test employed; *f* position of tube subsequently added to ventilate the trap.



In the first experiment a small glass tube was placed at *d*, containing solution of ammonia; in fifteen minutes it passed up the tube, through the water, and discharged the acid, with which litmus paper had been reddened, suspended at *e*.

In another experiment, instead of litmus paper at *e*, a small test tube containing a little Nessler solution was introduced; in half an hour the reaction of ammonia was very distinctly visible.

The tube was left suspended by metal wire all night, and in the morning the wire was eaten through, and the test tube had fallen to the bottom.

An objection was taken to these experiments because ammonia is lighter than air, and has a strong affinity for water. Other gases, heavier than air, were then tried; the results were much the same, as will be seen from the table now given.

Gas.	Sp. Gr.	Source.	Test.	Time for reaction to show.
Ammonia .	0·50	Solution.	Litmus . .	15 minutes.
do.	do.	do.	Nessler . .	30 minutes. Eat through a small wire in less than 24 hours.
Sulphurous acid.	2·25	do.	Litmus . .	1 hour.
Sulphuretted hydrogen.	1·25	do.	Lead paper .	3 to 4 hours.
Chlorine .	2·50	do.	Iodide of starch paper	4 hours.
do.	do.	do.	Litmus water in trap	Began to show in a few minutes. In half an hour the whole was bleached.
Carbonic acid.	1·50	Generated	Lime water in trap	1½ hours.
do.	do.	do.	Litmus suspended at *e*	3 hours.

Against these experiments, it was urged that the result would be different if the trap were ventilated. To meet this objection they were repeated with the

trap somewhat modified by the introduction of a ventilating pipe, which is represented by the dotted lines in the figure. The results were much the same except that the reaction was longer in showing itself.

Mr. McTear, F.C.S., repeated and varied these experiments, with similar results.

When formerly exhibiting these experiments I did not altogether ignore the possibility of decomposition going on in the trap itself, but I am not sure that I gave it the prominence to which I think it is entitled.

I have been re-investigating this branch of the subject, and I feel convinced that a considerable amount of decomposition does go on in the trap, for this reason that fæces float on the water, and cannot pass from a trap or cesspool till they dissolve, and during this process a certain amount of decomposition must take place.

I have examined several varieties of traps and cesspools, and have invariably found that fæces lodge on the house side.

If this is fully considered it will show how difficult it must be to flush house-drains, as no mere flow of water will carry off the fæces. I have, day after day, flushed the same cesspools and traps, and as the only result of the greatest possible flow of water, found that the floating fæces were simply kept whirling round in it.

It may be said that the floating of fæces may be owing to the greater specific gravity of the water in the cesspool or trap. I have never found it higher than 1001½, and for the most part it is but little heavier than pure water.

If then fæces decompose on the house side of the trap, it is obvious that we must have proper openings for the escape of the gas on that side also, to prevent it making its way into the house. This can be done in several ways. 1. By severing the connection between the house drains and the sewer, or, in other words, run the sewer for a greater or less distance in the open air and—if there is any danger or dread of the gas from it causing a nuisance—into the open part, a wire cage may be inserted, sprinkled at the bottom with charcoal. 2. Traps may be used with openings and ventilation on both the house and sewer side of them. In all traps the tongue or clipper should be as little as possible under water, that every facility may be afforded for the escape of solid and semi-solid matter.

But if flushing will not remove fæcal matter it may next be inquired whether the use of disinfectants might not go far to prevent its being injurious? In considering this question we must keep in mind the quantity of decomposable matter shut up on the house side of the trap, and remember that this is daily being added to—in tenemented houses we might say hourly—and then let us try to calculate how much of a disinfectant must be used to prevent the decomposition of such a mass of matter. I believe that were any one to watch from day to day the floating fæcal matter of an opened cesspool or trap, he would before long be convinced that the idea of the renowned Mrs. Partington to keep back the Atlantic with her broom was about as reasonable as the idea that we can prevent the decomposition of the fæces of the community by pouring disinfectants into water-closets, sinks, fixed basins, etc.

Recently, I was asked to inspect some houses where there had been a considerable prevalence of typhoid fever. I believe it had been imported into the district by milk, and spread by the influence of sewer gas. The houses were good and by no means old.

In the interior I found that generally the water from the bath and a fixed basin passed into the trap of the water-closet, causing the water in the pan to be agitated every time the bath was discharged.

This I consider a very bad arrangement, as the hot water would have a tendency to promote decomposition in the trap.

Outside I found a large deep cesspool about three and a half by two feet, and from two to three feet deep.

The entrance pipe, bringing the rain water and house drainage, was a little above the level of the water in the cesspool, while the exit pipe was several inches below the same level.

Covering the whole at the surface of the ground was an impervious stone, fitting very tightly over the opening, in fact it was hermetically sealed.

On removing this stone there was considerable smell, and on stirring the water a copious evolution of gas; at the same time there was a considerable deposit at the bottom of the cesspool, although it had been cleaned out only two months before.

The surface of the water was covered with floating fæces, which was not diminished by the most copious flushing. I have already remarked that there was the characteristic smell of sewer gas when the cover was taken off, and that the contents of the cesspool were in an active state of decomposition, as evidenced by the copious escape of gas when the contents were stirred.

Now in the every day condition of this cesspool, with the cover impervious and sealed down, where did this gas escape to? Not into the open air, and not into the sewer, the opening into it being several inches below the surface of the water. It could only do so by the pipe bringing the house-drainage and rain-water into the cesspool. In a word the decomposition of fæces in the trap of the water-closet being facilitated by the hot water from the bath, the cesspool, from its capaciousness and the depth of the exit pipe, was as much a laboratory for the production of sewer gas, as if ingeniously contrived to be so. This gas was compelled by the close stone cover to pass either up the rain-water pipe or into the houses; it would more probably do the latter from the higher temperature within them. I have repeatedly found the house pipes to the drain carelessly jointed, and badly laid, giving free escape to foul gas, which may however have some distance to travel before it finds exit, and thus render it extremely difficult to discover whence the smell originates.

Elsewhere, viz., *Edinburgh Medical Journal*, February 1874, and *Social Science Transactions*, 1874, I have published a table, compiled from the Registrar General's returns from 1838 till 1871, which clearly shows the increase of excremental pollution diseases, of which I shall give a few particulars; thus, the average per annum of the first five years, viz., from 1838 to 1842 is 298 deaths per million of the population from the diarrhœal group of diseases.

For the last five years, viz., from 1867 to 1871, the average amounts to 1,161 deaths per million. I may mention that during neither period was there the disturbing influence of a cholera epidemic.

Of diphtheria there is not a single case recorded till 1851, at which period we have two deaths per million of the population. In a few years, viz. in

1859, the deaths reached their maximum, viz. 487 per million of the population.

If we take the total number of deaths from zymotics and from other causes we find in the first five years above alluded to that the numbers are :—

From 1838 to 1842.		From 1867 to 1871.	
Zymotics .	3,770	Zymotics .	4,282
Other causes	18,308	Other causes	18,059

The increase in the one group of diarrhœal diseases, viz., 863, more than accounts for the total increase of deaths in the latter period. There was a decrease in the deaths from other causes not traceable to excremental pollution.

In the papers already referred to, I have related cases showing the production of typhoid, diphtheria, etc., from decayed lead pipes, and defective house drainage. I have also stated that after years of study the only conclusion I could come to was that the true sanitary remedy was that no excremental matter should be allowed to enter the sewers, or any water course or river, and that provision should be made by which all such matter should, within twenty-four hours of being voided, be subjected to chemical or other action, rendering decomposition impossible.

But instead of going over this ground again I shall devote a short time to the consideration of how our present system may be improved and ought to be watched.

It is the province of engineers to go into minute details about sewerage, and I shall content myself by giving a few hints by which I think the drainage of towns by our present system might be improved.

1. Streams should never be arched over and used as sewers, because as the bed is always irregular and uneven, the flow will be retarded, and refuse matter will lodge and decompose in the crevices. If it is ever advisable to follow the course of a stream, then a regularly built sewer should be constructed.

2. Care should be taken that sewers are laid in firm earth that will not 'give.' In 'made' or loose sandy soil they should be laid in concrete, or Brooks's patent might be used.

3. If also sewers are to pass through walls, great care should be exercised to prevent pressure upon them from the subsidence of the said walls. This might be done by making an archway, and allowing the drain to pass under it free from all contact. When this is not attended to, the drains frequently get broken or cracked, and so allow the escape of noxious gases.

4. The small drains should open obliquely into the larger, in the direction of the current of water running in the latter.

5. Iron and glazed earthenware pipes should be used as much as possible for house, soil, and drain-pipes—lead pipes being very subject to decay.

6. There should be a disconnection between the house-drains and the sewers, to effect which a number of contrivances have been suggested. When complete severance cannot be effected, there should be free openings both on the house and sewer sides of the trap.

7. A plan of all the drains of each town and district should be prepared, and be readily accessible to the public, and in the same plan the subsoil of the locality should be indicated.

8. A plan of all the house-drains, showing their connection with the sewers, should be given with the title-deeds of every house.

It is quite a mistake to conceal house soil-pipes by putting them, as is generally done, in some out of the way corner covered from view, defects in them often existing and producing much mischief without being suspected. Even the drains in the basement of houses should be laid in a built tunnel covered with flags, so that from time to time any of them might be lifted and the drain inspected.

9. The laying of drains, their jointings and levels, insertion of soil-pipes, and, indeed, everything connected with drainage, should be subjected to a most stringent and intelligent supervision.

Very recently, on examining a tongue trap in my own house, I found so much matter on the house side of it that I resolved to try whether I could not effectually prevent the entrance into the house of any sewer gas which might arise from its decomposition.

Accordingly, I placed the trap near the main drain, and laid the house drain open for several feet. Over this opening I suspended a wire cage filled with seaweed charcoal, and covered the whole with an iron grating, my object being to prevent all gas generated on the house side of the trap from getting into the house, and at the same time to deprive this gas as much as possible of its noxious elements by making it, in its escape, pass through the charcoal. This plan can very easily be adopted in the back-yard of all houses when the sewage flows to the back.

Still considering the subject as regards our present system, I may be allowed to state that to ventilate the sewers is quite as important as to trap them.

Before entering on this, however, let us pause a moment to inquire whether we are using a proper term.

The term 'ventilation,' I should suppose, means the replacing of foul air by fresh air; of which, in a vast majority of cases, the various plans proposed, certainly fall short. They do indeed provide for the escape of a certain portion of foul air from the sewer into the open air—not however to be replaced by fresh air, but by equally foul air, from the decomposition going on in the sewer.

I must not be supposed as undervaluing the sanitary advantage of the removal of foul air from the sewers. I am simply attempting to show that it is not sufficiently done; indeed that ventilation strictly so-called hardly exists. Formerly I did believe in the ventilation of sewers, and some six years ago proposed that it might be effected by attaching pipes to the sewers and leading them to the under surface of the numerous boiler fires in cities. This was quite a cherished idea, and I abandoned it with great reluctance; but, experiment, observation, and reflection compelled me to do so.

If we were to connect the sewers with furnaces, or build ventilating shafts, and create a current by fire, no doubt we would have an up-cast draught of air, though I fear very little of it would come from the vitiated air in the smaller drains, but from the nearest rain-water pipe, or from the open gratings in the streets. I quite consider that we can allow a portion of the vitiated air to escape; that doing so is a correct sanitary measure, much good having resulted from efforts in this direction, and the benefit being increased by the various ingenious contrivances to render innocuous the foul air so discharged.

In conclusion, I now ask if it is true that cholera, diphtheria, typhoid fever, and diarrhœa are traceable to the taking into our systems by air or water the results of decomposition of human excreta; if it is

true that these diseases, and others from the same cause, swell our death-rates and carry off some of the most valuable of our population; if this is really the case, then I affirm that the only true sanitary solution of our difficulty is, that all excreta shall either be returned to the earth, or subjected to chemical action, rendering decomposition impossible, and I am furthermore sure that if a tithe of the time, skill, and ingenuity, and one thousandth part of the money which have been devoted to water carriage had been spent in investigations in this direction, the problem of the sewage question would have been solved long ago.

DEATH IN THE COAL MINE.

BY JOSEPH NEWTON, A.I.C.E.

THE series of frightful disasters which, during the last few weeks, has occurred in the coal-mining districts of this country, has naturally attracted public attention to the whole subject of coal getting, and the normal and abnormal perils to which coal-getters are liable. If the deeply painful impressions induced by the minute and sickening details of the daily press do not die out prematurely, they may be utilised and made to effect good in the future. Unfortunately a leading characteristic of our time is a proneness to sensationalism, and too often the recollection, and the lessons taught by one catastrophe or one crime are merged in and obliterated by the consideration of another of more recent occurrence. Thus in the instances to which we are more especially referring, unless prompt action be taken, and persistent efforts be made to prevent it, they also will become only 'a nine days' wonder,' and then be forgotten.

For our own parts we are determined to make a vigorous effort to prevent so lame and impotent a conclusion, to direct and fix the mind of the public upon the probable causes of the late colliery accidents, and to suggest practical means for, at least, lessening the frequency of such dire calamities in time to come. It is a fact, demonstrated beyond controversy, that nearly all the great explosions in our coal-mines have taken place between the months of November and March, and those of Nantgarw, New Tredegar, and Barnsley, which have just taken place, are not exceptions to the rule. Hence then the fact is established that miners run their maximum amount of risk in the winter season, and the lesson should have been learnt by coal-mine owners long ago that extraordinary precautions are essential at such times. Whether these were taken in the case of the recent accidents it is not for us to determine, but it is our province to endeavour to explain the reason why colliery disasters are likely to be most numerous during the gloomier months of the year. Our theory is that the air is then more dense, the hydrostatic column has less elevation, and, as a matter of course, the pent-up gas exudes more freely than in summer-time, when the converse to these conditions exists. It is not improbable, either, that this increased leakage of gas from the interstices of the coal-seams may be further contributed to by the impossibility of its finding its way through the frost-bound surface of the earth to the atmosphere above.

If these hypotheses, briefly put, are based on truth, they proclaim, intelligibly enough, that it is madness to liberate more gas in any pit during the winter months than can easily be swept out of the workings by mechanical or other means. The double shift system, therefore, which, as its name implies, involves the almost continuous 'getting' of coal, and the consequent release of large quantities of gas by day and by night, is fraught with excessive danger in the winter season especially, and ought not then to be put in practice at all. It is to be feared, however, that this simple and obviously wise precaution is not generally observed, and probably it may not be so until some legislative enactment makes it compulsory.

It has been already observed that means should exist for sweeping out, as it is technically termed, the accumulating gases of a coal-pit. This, again, is a vital point, and no doubt defective ventilation has been a fruitful source of so-called 'accidents' in coal-pits. The usual plan adopted is that of carrying air down the shafts and along one side of a 'brattice,' for the whole length of the workings, and then returning it through a furnace once more to 'bank.' Much wiser would it be, to our thinking, to force air into a pit at a pressure somewhat in excess of that of the atmosphere, either by means of fans or pumps. If practicable the downcast shaft alone should be used for conducting the air, but if not, a pipe of the necessary dimensions might be made to pass the whole way from the air-injecting apparatus to the shaft bottom. From this point another pipe or pipes, attached to the main inlet, could be led into the mine, with simple pressure valves placed at intervals along its surface, and with branchways for cross headings. Such would be the principal air-feeding arteries, whilst the subsidiary ones, in the shape of flexible hoses, would be carried direct to the face of the coal, and to each board where men were at work.

This accomplished, and with proper steam power to work the fans—if fans were preferred to pumps—it will be readily understood that a supply of air of superior pressure to that of the atmosphere might be discharged at every point where the coal is being worked. The next and obvious result must be that all gases and air of inferior pressure would at once rush to the base of the upcast shaft and thence to the outward atmosphere.

The simplicity, effectiveness and comparative safety of this plan of ventilating mines will be more clear if the present, or sweeping system be shortly described. A current of air is driven from the shaft to the face of the coal, carrying with it all the gas or foul air with which it may become charged in the way. Having with its foreign accumulations reached its first destination, it is brought back on the other side of the brattice and there, perhaps, mixed with sufficient air to make an explosive compound of the whole! Should the circuit so far be completed in safety, it still has to pass the great furnace at further risk, and at length it escapes through the upcast shaft to the outward atmosphere.

Our readers will now be able to comprehend the peculiarities of each mode of ventilation, and to judge as to which is likely to be the more safe and serviceable in the coal-pit. Having thus touched upon two or three of the great points connected with mining economy, it will be well to advert to another one, which is of scarcely less importance, namely, the means of lighting pits, and which is almost inseparably connected with their ventilation. The Davy Lamp (with all respect to the memory of its inventor be it said,) is, in its present form, objection-

able. In the first place, a man must carry it if he requires its light, and he cannot work with a lamp in his hand. Hence he must put down his 'Davy' somewhere. Generally, as it has a narrow base, it is deposited upon, or rather stuck into, a heap of small coals. This is often done hastily and without regard to its vertical position. The result is, that the gauze of the lamp is burnt on one side, and it may be that a blow up follows. Its owner is too much absorbed in the task of getting as much coal as will ensure his day's pay, to allow him to devote attention to this source of danger. He works on by its dim light, and possibly, in his anxiety to see better what he is doing, opens it by stratagem or force.

Now it is not intended to deprecate altogether the employment of safety lamps; they have their uses undoubtedly, but we contend that they are all of a makeshift character.

The time has come when colliery owners and their engineers should endeavour to organise systems of lighting up the whole of the workable mines by gas. This should be collected wherever it could be obtained from the workings, conducted to accumulators above, and then returned under pressure by means of pipes. The lamps might be placed at proper intervals and in such places as were considered secure. The lamps themselves should be made in the form of 'ships' anchor lights,' with a glass globe in the centre and the upper part covered with wire gauze to allow the heated gases to escape above the flame and to prevent any encroachment of gas from without. The lower part of the lamp should also be covered with gauze, but communicating directly with the main air-pipe by means of small branch pipes. The advantage of supporting combustion in the lamp by pure air from above will be at once apparent. The illuminating power would be nearly double. It would be easy to enlarge upon the momentous questions of the better ventilation and the better lighting of coal-pits, but the purpose of the writer will be served if the more earnest attention of scientific and practical men be drawn to the subject.

In a future chapter the use of gunpowder, the firing of shots, the employment of imperfect apparatus, defective propping, and other accessaries in the promotion of death in the coal-pit, will probably be adverted to. In some way the annual slaughter of 1,100 or 1,200 men and boys in the world underground must be prevented.

THE SALE OF FOOD AND DRUGS ACT.

IT appears, from a communication which the Secretary of the National Chamber of Trade has received from the Board of Inland Revenue, that the maximum amount of the scale of charges which they propose to make for the analyses of samples by the chemical officers of their laboratory at Somerset House, in disputed cases referred under the Sale of Food and Drugs Act of last session, will not exceed twenty-one shillings; and it would seem that it is to be gathered from the reply that the charge for articles of easy analysis—such as cocoa, mustard, etc.—will be very small. We believe that it was understood, when the bill was passing through the Houses of Parliament, that the appeal to the Somerset House laboratory would be inexpensive; and we think that the proposed charges fully bear out the expectation, and that the trade may be congratulated upon getting an independent and responsible analysis for so moderate a sum.

THE
SANITARY RECORD.
SATURDAY, DECEMBER 18, 1875.

The Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers read before the members of any sanitary or kindred association.

THE EFFECT OF MIGRATION UPON DEATH-RATES.

THE publications of the Registrar General during the past thirty-five years have contributed not a little to arouse public attention to the terrible waste of life that has been so long going on around us. This effect has in great measure been produced by the continual comparison of the rates of mortality which prevail in towns and in rural districts. The value of death-rates as calculated by the Registrar General, that is the simple proportion of deaths to population, have in recent years been vigorously called in question, on many grounds, by Dr. Rumsey, Dr. Letheby, Dr. Child, and others, who, however, cannot be said to have established a case to justify the surrender of this convenient method for estimating sanitary condition—a method which has at any rate played an important part in effecting recent sanitary legislation, including the Public Health Acts of 1872 and 1875, and the Artisans' Dwellings Act, 1875. Careful examination has proved that the true effect of influences which disturb the scientific accuracy of general death-rates is too small to affect their value for those purposes to which the Registrar General applies them, and to which they are generally applied by the public and the press.

Among the grounds which have been so often urged against the acceptance of the general death-rate as a test of sanitary condition is the effect of migration. As regards the value of death-rates for the purpose of comparison between those of town and country—and this is one of the principal uses to which they have been put—the effect of migration undoubtedly deserves full consideration. The deaths registered in towns almost invariably include a considerable number occurring in public institutions, especially in hospitals, which are not deaths of residents; whereas it is equally certain that the deaths of many persons who are counted as residents in towns, occur in the rural districts outside the towns, to which domestic servants, shop assistants, and others often retire when attacked by illness, contracted probably in consequence of residence in unhealthy towns. In calculating death-rates in town and country, for general purposes of comparison, it has usually been assumed by the

Registrar General that these two disturbing influences balance each other; and it has yet to be proved which of these influences, having undoubtedly a compensating tendency, is the more powerful.

With reference to the influence of migration upon death-rates, much useful and careful work has been done by Mr. J. A. Welton, F.S.S., who read a valuable paper on the subject before the Society of Actuaries in 1870, and a paper more recently before the Statistical Society. Many of the facts and figures in these two papers are well worthy of study and investigation, and they have doubtlessly shed considerable light upon a fact which has frequently been pointed out by the Registrar General, and others writing upon vital statistics; namely, that the death-rates among males between the ages 10-25, and among females between 10-35, living in towns, is almost invariably lower than among those living at the same age outside towns. This has been mainly attributed by Mr. Welton to the deaths of immigrant town residents, who when their health fails, return to their native districts frequently to die. The undoubted fact of the low death-rates at these ages in towns is the more remarkable because the rates at all ages, and at each of the other groups of ages, show a marked excess in towns. Among the principal features in the excess of the death-rates at these ages outside towns, Mr. Welton directs particular attention to the fact that the fatality of phthisis at these ages outside London is nearly double what it is in London, although at all ages the fatality from this disease is greater in the urban than in the rural population. For instance, during the ten years 1861-70 the annual death-rate from phthisis among females at the ages 20-25 was but 2·7 per 1,000 in London, whereas it was 4·8 per 1,000 in the eastern counties of Essex, Norfolk, and Suffolk, which supply a large proportion of the immigrants into London. Again Mr. Welton shows that from all causes the annual death-rate among females aged 15-20 in the ten years 1851-60 was only 5·5 per 1,000 in London, against 7·4 in all England, and 8·3 in the counties lying outside London. Almost as much difference in favour of London residents was found at the next group of ages, twenty to twenty-five years. In a far smaller degree the same features are pointed out by Mr. Welton in the male death-rates at these ages.

Space now forbids the discussion of the causes which operate to produce at these ages low death-rates in towns and high death-rates in rural districts, whereas the opposite results are showed at all other ages. How far this is caused by the drain of the more healthy and vigorous part of rural populations at these ages into towns, which depresses the town rates, while it raises the rural rates; and how far by the deaths of these town immigrants occurring in their native localities, to which they return when invalided, can only be satisfactorily determined by laborious and extended local investigation, combined with the insertion of further particulars in the death-register than now find place there. There is one aspect of this question, however, which is really important in its bearing upon the value of general death-rates at all ages, which it has been urged is destroyed by the effect of migration and other disturbing influences. At the discussion which followed the reading of Mr. Welton's more recent paper at the Statistical Society, Mr. N. A. Humphreys urged the following facts in proof of his assertion that migration scarcely disturbs the value of general death-rates at all ages. Assuming, for the sake of argument, that the death-rate in London at these ages, ten to thirty-five, ought to show the same proportional excess as is showed at other ages, and adding to the deaths registered at those ages in London, a sufficient number so to raise the rate, Mr. Humphreys found that the extreme effect upon the rate at all ages was as follows: The death-rate of males in London in the ten years 1861-70 averaged 26·55 per 1,000, which, after the addition of the requisite number of deaths at the ages ten to twenty-five, becomes 26·82; the female rate in the same period, with a similar addition of deaths between the years ten to thirty-five, is raised from 22·34 to 22·93 per 1,000. The mean death-rate among persons, with the addition of the requisite number of male and of female deaths to balance the asserted under-statement of the deaths in London between the ages ten to thirty-five years, is only raised from 24·31 to 24·75 per 1,000. Thus the extreme under-statement of the London annual death-rate in the ten years 1861-70, due to this disturbing influence of migration is only 0·44 per 1,000; an extent of disturbance so small as scarcely to affect the value of general rates for those purposes to which they are usually applied.

Without attempting to underrate the desirability of discovering the true explanation of the fact that the death-rate of young persons aged between ten and twenty-five years is so much lower in towns than outside them, it is re-assuring to find that the amount of disturbance, whether from migration or other cause, although so great at these ages, is scarcely appreciable when merged in the rates at all ages. The use of death-rates at all ages as a test of sanitary condition need not, therefore, be surrendered on account of the disturbing influence of migration.

Notes of the Week.

DURING the recent severe weather Lieutenant-General Sir Thomas Steele, commanding at Aldershot, authorised the issue of extra fuel to the troops.

THE Madras Government have sanctioned an expenditure of 166,000 rupees for the erection of a new gaol at Palamcottah. The sanitation of the building will be strictly attended to.

AN order for the formation of a local board for New Mills, Cheshire, has been received by the promoters, and the election is expected to take place the second week in January.

THE Whitby Highway Board have decided that, in consequence of the state of the Cleveland labour market and the general reduction of wages, the wages of men in the employ of the board shall be reduced *2d.* per day for the winter.

MR. ALFRED SMEE, F.R.S., read a paper on the Regulation of Sewage-Grounds at the Society of Arts on the 1st inst., and made his accustomed onslaught on Croydon. Dr. A. Carpenter was present, and replied vigorously.

THE Council of the South Yorkshire Miners' Association have resolved to request the National Association of Miners to take up the question of explosions in coal-pits, and to urge upon the Government the necessity for further legislation on the subject.

THE Taunton Local Board have passed a resolution in favour of the incorporation of the borough; but a petition against it has been prepared and is now in circulation for signature, the principal objection being that incorporation will in all probability lead to increased taxation.

MR. ROBERT MORGAN, C.E., visited Accrington on the 25th ult. to make inquiries into public works for which the local board had applied for sanction to borrow 16,000*l.* to execute. The inspector suggested that the estimate should be increased by 3,200*l.*, so as to cover a site purchased by the board for public baths.

THE annual report of Mr. R. Hunt, Keeper of the Mining Records, states that the coal raised in the United Kingdom last year amounted in round numbers to 125,000,000 tons. There was a decrease in the home consumption of 3,592,832 tons, of which the diminished quantity used for domestic purposes in London alone, accounted for 400,802 tons.

IN a case lately tried before the Vice-Chancellor's court, *The Attorney-General* v. *The Hyde Chemical Company*, an affidavit was put in evidence, testifying that within the last month the medical men in the neighbourhood had sent about forty children suffering from whooping-cough to the manufactory to inhale the fumes of pitch, as a curative measure.

THE Kensington Vestry having this year tried the system of watering the roads by means of Bayley's hydrostatic vans and found it to answer satisfactorily, both as regards the cost and the efficiency of the work performed, have decided to purchase the whole of the vans, thirty in number, and adopt the improved system exclusively for the future.

SIGNOR MINGHETTI has requested sanction from the Italian Chamber of Deputies for the immediate commencement of the necessary operations for diverting the channel and of regulating the flow of the river Tiber. The cost of the necessary works for this great undertaking, from which great sanitary results with regard to the health of Rome are expected, will be defrayed out of the Budget for 1876.

THE Birmingham Watch Committee have adopted a proposal by the mayor, Alderman Joseph Chamberlain, to appoint five inspectors, at a salary of 3*l.* a week, whose special duty it shall be to visit public-houses, with a view to detecting publicans who supply drink to persons who are already intoxicated. Alderman Chamberlain criticised the action of the justices in dismissing charges of this nature recently brought before them.

A CROWDED public meeting was held in the Victoria Hall, Leeds, on the 13th instant, under the presidency of Mr. Carter, M.P., in favour of the Permissive Liquor Bill. The resolution called upon Parliament and statesmen of all parties to deal vigorously and promptly with the liquor traffic on the ground that it is the primary cause of all the great evils of our civilisation, including ferocious brutality, female degradation, reckless prodigality, and wretched pauperism. The principal speaker was Sir W. Lawson, M.P., whose remarks were received with great applause.

IN reply to a memorial recently presented to Mr. Sclater-Booth, M.P., by a deputation of the inhabitants of Croydon and South Norwood, an official intimation has been received to the effect that a Government inquiry will be held relative to the epidemic of typhoid fever with which Croydon was visited during the spring and autumn of the present year. The Local Government Board have instructed Dr. Buchanan to inquire into the cause of the epidemic, and to report to them on the sanitary state of the district.

WITH a view to prevent the recurrence of fever, which the Croydon Board of Health believe to have been due to some contamination of the water when the supply was intermittent, application has been made for permission to borrow the sum of 14,100*l.* to extend the water-works and furnish the town with a constant supply. An official inquiry into the details of this proposed expenditure has already been made by Mr. Arnold Taylor, by direction of the Local Government Board, and it is anticipated that the reply of that department will be favourable to the application.

POLICE-CONSTABLE JOHN PEGG, 446, of the City of London Police, was presented with a gold watch, value 30*l.*, at a meeting held on Friday evening last. The testimonial was provided by the subscriptions of a number of London tradesmen, in recognition of the extraordinary skill shown by Police-Constable Pegg in detecting horses cruelly worked while suffering from wounds and sores. It was announced at the meeting that, in addition to a subscription from Lord Shaftesbury, Mr. Colam, the secretary to the Society for the Prevention of Cruelty to Animals, had awarded the 'Horses' Friend' the sum of 5*l.*

MR. FORSTER, M.P., had an interview, on the 13th inst., with some members of the London Trades' Council, who conferred with him respecting the regulations of the Privy Council regarding the importation of cattle, and whether existing restrictions increased the price of meat to the English consumer. The right hon. gentleman did not express any opinion as to whether those restrictions ought to be continued, but hinted that they had not so much to do with the high price of meat as was generally supposed, the price being attributable, in his opinion, rather to the increased demand. He promised, however, that if the restrictions should be found to be unnecessary, he would do all in his power as a member of the House of Commons to get them withdrawn.

THE obituary of the *Times* of the 10th inst. contained some remarkable illustrations of prolonged existence in seven persons, viz., four ladies and three gentlemen, whose united ages amounted to 610 years, giving an average of more than 87 years to each; but then one of them, a lady, had reached the great age of 100 years, the youngest of the same sex being 81. Of the gentlemen the oldest was 89 and the youngest 84 years of age. The following were the respective ages: 81, 83, 84, 86, 87, 89, and 100, the latter being the Lady Louisa Stuart. Of septuagenarians there were 11, ranging from 70 to 78 years of age. It is something remarkable that a single day's obituary in the *Times* should record the deaths of 18 persons whose united ages amounted to 1,425 years, giving an average of 79 years and two months.

MR. CROSS, the Home Secretary, received a deputation on Tuesday last, when a memorial and resolution passed by the National Chamber of Trade was presented to him, complaining of the arbitrary manner in which the Smoke Nuisance Abatement (Metropolitan) Act is administered. A promise was given to the deputation that no cause of irritation should continue where it could possibly be avoided.

NEWS have been received of the atrocious murder by Indians, at Barclay Ford, of a Father Brabant, a Roman Catholic missionary priest, who by vaccination and assiduous care, in the absence of any medical man, had used his utmost endeavours to arrest the progress of an epidemic of small-pox. The Indians, however, have taken it into their heads that it has been the cause of the disease, and about a week ago, when visiting a hut, the chief of the tribe came in with a loaded gun and shot the unfortunate gentleman.

SANITARY VIGOUR.

IT was recently reported to the Portsmouth Town Council by the medical officer and the engineer that sixteen small habitations had been built in defiance of the by-laws upon a site which had been for years a common receptacle for sewage refuse; whereupon, after discussion, a resolution was passed that notice be given to the builder requiring him to pull down the houses. If the same sort of vigour were manifested by local authorities generally we should hear less of the building of wretched houses for the poor upon unsuitable sites, which eventually become centres for zymotic disease and foci of epidemic infection.

SEATS IN SHOPS.

WE should be glad to hear that some progress was being made in London in 'the movement' to induce shop-keepers to allow 'the young ladies' to relieve themselves from the excessive fatigue of standing the whole day by allowing them to sit in the rare intervals of occupation at the counter. We believe that the rules of West End shops are most rigid. The 'young ladies' are not only not allowed to sit; but they must not even 'lean,' or 'lollop,' as the shifting to an easier attitude than that of erect standing is technically described by the shop-walker. It is part of the duties of that elegant and polite personage to keep a sharp eye upon the young persons, and to see that they stand at the counter in due regimental order. It is well known to those who are engaged in the graceful task of assisting to find 'employment for women,' that there is no class for whom it is more difficult to find employment than the shop-girl, whose early years of good looks have gone, and whose health and strength are broken down by the incessant standing for twelve hours a day for a series of years. We need not here catalogue the series of complaints which prolonged standing almost invariably produces; only the young can endure it, and only the young are employed as shop-girls. We feel perfectly sure that purchasers will not object to see them sitting in the intervals of serving, and we trust that their employers will yield to these representations in favour of a more merciful treatment of their *employées*.

WATER-SUPPLY.

DR. FRANKLAND, F.R.S., as the result of his analysis of the waters supplied to the metropolis during November, reports that, taking unity to represent the amount of organic impurity in a given volume of the Kent Company's water, the proportional amount found in an equal volume of the water supplied by each of the other metropolitan companies was:—New River, 3·6; East London, 4·6; Lambeth, 6·3; West Middlesex, 7; Southwark, 7·2; Grand Junction, 7·4; and Chelsea, 7·8. Owing to the heavy floods, the river water during November was polluted with 'large quantities of suspended impurities and of soluble organic matter of a brown colour;' and the five water companies drawing their supplies from the Thames delivered almost throughout the month, water which was 'quite unfit for domestic use, even after efficient filtration.' Dr. Frankland further reports, however, that the West Middlesex was the only one of the five companies which delivered water that had been efficiently filtered; the water of the four other companies being turbid and containing moving organisms. The Grand Junction water 'gave a deposit consisting chiefly of matted fungoid fibres.' The New River and East London Companies supplied water of a superior quality, that had been efficiently filtered, while the Kent Company's water, derived from deep wells in the chalk, was as 'pure, brilliant, and palatable as usual.'

With reference to the water supplied to Birmingham during the month, Dr. Hill, the medical officer of the town, reports that it was slightly turbid, of a greenish-brown colour, and that the proportion of organic nitrogen was higher than at any previous time of the year.

ANOTHER BUTTERMAN'S 'GRIEVANCE.'

THE tradesmen dealing in butter who purvey this article to the inhabitants of the transpontine districts, appear to be particularly unfortunate, if we are to judge from the police-court reports of the working of the Adulteration of Food Act in this particular.

William Foy, or Fog, of Friar Street, Blackfriars' Road, stated to Mr. Partridge, the magistrate, that he purchased as good butter, and paid 98*s.* per hundredweight, or 10½*d.* for the pound, for some fatty matter, which when sold by him to the sanitary inspector of St. George's Vestry, turned out to contain no butter whatever, except a slight smell of it. If, as stated by the defendant, this article was sold to him as good butter, by Mr. Harvey, of West Smithfield, and, if, at the same time, the retail dealer could not tell whether it was butter or not, the most obvious grievance would appear to be sustained by the customers in the neighbourhood of Blackfriars. If, on the other hand, Mr. Harvey did not sell the compound for butter, but for what it really was according to the report of the analyst, 'something more wholesome and much better than rancid butter,' the remedy would be, not as Mr. Partridge is reported to have expressed it, that the defendant should not purchase such an article in future, but that he should retail it under its proper designation. It must be quite evident that Mr. Partridge's remark overstepped the limits of caution, both in the legal and sanitary sense, because every man has a right to buy or to sell what is wholesome for food, so long as it is properly described at the time of sale. As the magistrate cannot prevent it, and dietetic science sanctions the use of other wholesome fats besides butter, it would be better if it were more distinctly understood, that Mr. William Foy was fined for the sale of fat under the name of butter which was not butter, and not because he sold a substitute which was more wholesome than ordinary butter at the same price.

TRANSFORMATION OF A LONDON GRAVEYARD.

THE East of London, as compared with other parts of the metropolis, is sadly deficient in breathing spaces, and all who are interested in the welfare of the poor in that overcrowded district will be heartily glad to know that by next summer another public garden will be in existence there. The Metropolitan Board of Works, at its meeting last week, unanimously voted, on the recommendation of its Works Committee, the sum of 1,206*l.* as its contribution of one half of the cost of purchasing—for the purpose of laying out as an open space for the health and recreation of the inhabitants of East London—a portion of the burial ground attached to the parish church of St. George's-in-the-East, and certain ground adjoining, belonging to the trustees of St. George's Wesleyan chapel, as advocated in the SANITARY RECORD, p. 339. The ground belonging to the chapel trustees is, we believe, also an old

burial-ground, and the old chapel itself is to be pulled down, and its site is included in the purchase, and will consequently form part of the contemplated garden. The remainder of the cost of purchasing these burial grounds will be defrayed we believe by the vestry of St. George's-in-the-East, but the whole of the money will be in the first instance advanced by the Metropolitan Board, so that the purchase may be at once completed.

It is unquestionably making a most admirable use of an old churchyard in such a district as St. George's-in-the-East to turn it into a public garden. Such spaces when disused are too frequently covered with buildings. London outside of this East end parish will not, we are quite sure, grudge its share of this contribution of 1,206*l.* out of the rates; and a sum of 2,412*l.* has been rarely spent to better purpose than in providing in the midst of a dense population this new 'lung' for the healthful recreation of the inhabitants. This particular district is indeed exceptionably destitute of open spaces, and the one which is now to be preserved, not in its present melancholy condition, with its depressing aspect suggestive of anything but recreation, but as a smiling garden with grass and shrubs, and, we hope, flowers in addition, will form a bright oasis in a desert of bricks and mortar.

THE RAINFALL AND PUBLIC HEALTH.

IN almost all parts of England, the rainfall during the eleven months of the present year already elapsed has been excessive. The *British Medical Journal* states that the year 1872 was one of the wettest years on record, but at Oxford the rain which had fallen before November 15 of this year exceeded the fall there in 1872. The rainfall in September, October, and the early part of November, was reported from nearly all recording stations as excessive. At Bristol, during the nine weeks ending November 20, the total rainfall was 15·942 inches, the average quantity for the same period being 6·200 inches; consequently, the excess above the average was 9·742 inches in the nine weeks. In other localities the downpour was equally great. The result has been a series of disastrous floods in all the low-lying districts of the central parts of the country, the nearest parallel to which occurred as far back as November, 1852, during the lying-in-state of the Duke of Wellington. Where drainage is good, wet seasons appear to be generally healthy; at any rate, in large towns, where some of the principal causes of disease and death are impurities in the atmosphere, drains, etc. And the reason of this is obvious. The rain in descending first washes the atmosphere, from which it doubtless carries off zymotic particles, and then mechanically cleanses the streets and sewers; consequently, an abundant rain usually coincides with a low death-rate in town districts. But, in low-lying and badly-drained localities, where the water rises and enters the basement of houses, especially when the surface-water is added to the sewage of overflowing drains, disease is wont to be rife. It is to be feared that the present wet season will not prove an exception to the rule. But for the statistics which will show the exact effect of the rains and floods upon the public health, we must wait until the Registrar General furnishes his next valuable quarterly report. The weekly returns of deaths in the eighteen largest English towns do not as yet apparently exhibit any marked feature due to the prevailing wet. It is certain, however, that in many of the flooded districts, in which the houses have for days, and even weeks, had water lodged in the lowest rooms, much sickness will prevail, since the walls and floors will remain damp and unwholesome for weeks to come. To add to the misery of the inhabitants, who in the flooded districts almost all belong to the poorer classes, they have, by reason of the flood, lost in many instances a considerable part of their property; while the extreme cold which has set in at this early period of the winter will greatly aggravate their troubles (at a time when they cannot afford to pay for extra coals), produce disease, and augment the death-rate.

THE METROPOLITAN BOARD OF WORKS AND TORRENS'S ACT.

THE Metropolitan Board of Works finding that so many 'official representations' have been made to them by the metropolitan medical officers of health under the new Artisans' Dwellings Act, 1875, have determined to introduce a bill in the next session of Parliament, making them the local authority for Torrens's Act, instead of the vestries and district boards. The Metropolitan Board are of opinion that many of the houses included in the 'official representations' should be dealt with under Torrens's Act, as the expenses necessary for making the houses fit for human habitation would, in that case, fall upon the owners of the property rather than upon the rate-payers. As the old Act has not been repealed, it is clear that the legislature intended that each should be applied to the particular houses for which it was best fitted. The scope of the two Acts is somewhat different, and there is no doubt that many of the courts lately referred to the Metropolitan Board of Works as the local authority for the Act of 1875 should have been amended, shut up, or pulled down by the vestries or district boards under Torrens's Act. But as this would have involved the pulling down of property bringing a good rental to the owners, without making them any recompense, and as the provisions of the Act are very complicated, the vestries have remained almost passive in the matter.

In order to obtain some necessary information, the Metropolitan Board of Works have just issued a circular letter to the clerks of the vestries and district boards, requesting replies upon various matters connected with the Act. The letter is signed by Mr. Wyke Smith, solicitor to the board, and asks for 'information as to the steps which have been taken to carry Torrens's Act into practical effect' in the parish or district. That the board is desirous of being informed of any difficulty which has been experienced in carrying out that law, as the directions for serving notices on the owners and others interested appear to be of a complex character. They also wish to know if appeals to the quarter sessions have been frequent, or whether the owners have repaired or altered the premises so as to render them fit for habitation, and free from sanitary objections. Also, whether it has been generally necessary to shut up or remove the buildings; and in the latter case, if the owners rebuilt the premises. They have also asked the vestry clerks if they have any amendments to propose for curing any defects or enlarging the powers already given by the provisions of the existing Act.

These questions show that the Metropolitan Board are in earnest; and it is to be hoped they will persevere in their intention, and thus prevent the Act of 1875 proving a very heavy burthen on the rates, and a means of relieving landlords without loss, or even with pecuniary benefit, from worn-out, dilapidated, ill-constructed, and unwholesome houses.

OUR INVENTORS AND THE WATER COMPANIES.

AT a meeting of the Glasgow Philosophical Society, held on the 1st inst., a complaint was made during the reading of a paper that owing to a defect in the Corporation Water Act, improvements in water-fittings were virtually prevented. A very superior water waste-preventing tap had been rejected by the engineer of the Water Company, and it appears that other useful inventions had met the like fate. The discussion was kept up for some time, some members taking the part of the engineer, and some the part of the inventor. The conclusion which one of the speakers came to was that the engineer had really no time to examine into the merits of submitted novelties, and that justice failed perhaps in that way. He considered that the Water Committee ought to have the opinion of some outside scientific man upon new notions of the kind, not that, however, the committee were interested in preventing improvements from meeting with due attention.

We have in the metropolis a good deal of this kind of bickering between inventors and water companies' engineers, and we need not go beyond the matter of taps and water-waste preventers to prove what we say. Each engineer has formed his own opinions about which is the best appliance, and recommends it, and maybe, so as not to appear invidious, some few others. But there are sure to be some patterns which he will not recommend his board to adopt, at which exercise of his judgment the inventor feels aggrieved. This is the case with every water company more or less, and water waste-preventers which are even lauded in one district are rigorously tabooed in another. Householders may erect the wrong pattern, but as soon as the house is ready for the inmate, the engineer, or the agent, or the turncock in power will enforce its removal.

We cannot but feel for the inventor who resides in a town or city where there is but one water-company, and that inimical to his patent; and feel that in London the contrivers of a new apparatus are better off, since they have at least several boards to choose from.

Still they are not all successful in getting their goods passed; and a Birmingham firm may be said to bear away the palm, doubtless because his pattern is the best.

One thing we must confess to ourselves, and that is, that the proposal to construct an outside judge to control, so to speak, the engineer of the company would never act, even if it were possible that no difference of opinion would ever arise. An engineer who would agree to such a limiting of his position would be a curiosity. Still there might be a public tribunal where the old and the new systems could be compared; and we have plenty such in our exhibition gatherings.

A superior article must always find patronage in the long run; but no company would permit free-trade in matters of such consequence as water-waste preventers, or, as they are more frequently called now-a-days, 'water-wasters.'

METROPOLITAN AND PRIVATE BILLS FOR NEXT SESSION OF PARLIAMENT.

A LARGE number of notices have been given of new bills for the next session of Parliament. They include 129 railway bills, of which forty-five are for the incorporation of new companies, thirty-three for extension of time to complete works, six for deviations or abandonment of sanctioned lines and forty-five for various other railway improvements. There are five tramway bills, thirty-eight water and ninety-six gas bills, as well as numerous other bills by the Commissioners of Her Majesty's Public Works and Buildings, the Corporation of London, Metropolitan Board of Works and other public bodies.

Amongst these are several which are of considerable importance to the metropolis. Her Majesty's Commissioners of Public Works have given notice of taking lands and houses; 1st, for building a new Royal Mint near the Savoy; 2nd, for erecting a new Bow Street Police Court near the old court; 3rd, for erecting a large range of public offices adjacent to the India office. By the latter scheme a large number of houses will be pulled down and an opening made from Parliament Street to St. James's Park.

The Corporation of London and Metropolitan Board of Works propose, in their bill, to vary, regulate, and improve the quality of the gas supplied to the metropolis, and to improve the mode of testing, so that advantage shall not be taken of improved methods of testing gas, and thus obtaining a higher illuminating power without a corresponding increase in the quality. They also propose, as regards the Metropolitan Water Companies, that an alteration shall be made in the basis upon which rates, charges, and rents are, or may be, assessed, and thus prevent the companies from raising the rates on the new assessments. The Metropolitan Board of Works also ask for power (1) to compel or authorise the construction of works to prevent damage, from high tides, to property situated near the Thames; (2) to make Deptford Creek Bridge free from tolls; (3) to make a new street from Sun Street to Worship Street; and (4) to provide for the maintenance of the Chelsea Embankment.

One very novel scheme is proposed—viz. to make an arcade bridge on each side of London Bridge, to erect shops thereon, and levy tolls. In cold, rainy, or foggy weather doubtless many persons would pay a small toll to pass over the bridge under shelter, but we should think not at other times. There can be no doubt that many persons take severe colds in passing over the bridge at present, and that, with proper arrangements, it might be advantageous in a sanitary point of view, especially for the infirm and weak.

Proposals for constructing tunnels under the Thames; establishing a steam ferry between Poplar and Greenwich; and making the following bridges free from tolls—viz. Hammersmith, Fulham, Wandsworth, Battersea. The Albert and Chelsea suspension bridges, Waterloo, Lambeth, Vauxhall, Charing Cross, and Cannon Street foot bridges are also included in the list.

Special Report.

ON A REMARKABLE OUTBREAK OF TYPHOID FEVER.

By W. N. THURSFIELD, M.D.
Medical Officer of Health, Shropshire Combined Sanitary District.

IT is too much the custom just now to assume that we know everything that can be known about typhoid fever, and laymen especially are very prone to dogmatise in the matter. A very large experience in the investigation of outbreaks of this disease, under circumstances most favourable for arriving at sound conclusions, has convinced me that we have still much to learn about it, and that the record of those rare cases where all the connections and conditions admit of being completely investigated, would give results of the greatest practical value. Such opportunities most frequently occur in rural districts, where a more intimate knowledge of the habits, movements, and surroundings of the subjects of disease can be obtained, and where sources of error can be eliminated to an extent not possible in more crowded localities. Statistics of the disease, it is true, are by no means wanting, and in Dr. Murchison's unrivalled treatise on the continued fevers of Great Britain, very full tables are to be found with reference to almost every point; but their value from an etiological and sanitary point of view is very much lessened by the fact that to a large extent they relate to cases treated in hospitals, and with few exceptions drawn from town populations.

It has recently been my duty to investigate an outbreak which has appeared to me not only most remarkable, and on some points, so far as my experience and reading go, unique, but which I consider certainly worth recording, as giving definite and absolutely indisputable evidence, with reference to certain important points connected with the study of the disease under consideration.

About the middle of September last, a shooting-party of seven, consisting of three gentlemen and four gamekeepers, met by appointment for a day's sport; with the exception of a youth at school, they were all men in the prime of life, between twenty-five and forty-five. Within a month afterwards four

of the party were attacked with typhoid fever, and of the remaining three two suffered from diarrhœa, only one escaping entirely. With the exception of two who were staying in the same house they all resided in different houses widely apart from one another, and having absolutely no conditions in common. During the day of the shooting the only influences the party were subjected to in common were those of being exposed to the same miasmata, if any, and of taking the same food and drink.

As to the Nature of the Disease.—The four cases of typhoid fever which were all severe (two ending fatally) were treated in different parts of the country by seven different medical men, who all agreed in declaring them true typhoid fever, and one of the cases which, by the courtesy of the medical attendant, I was permitted to see, appeared to me to be a typical case of that disease; in three of the cases there was the somewhat unusual complication of severe ulceration of the mouth and fauces.

The two cases of diarrhœa were tolerably severe, confining the patients to the house but not to their beds; in both cases the patients had quite recovered by the end of the week, and the attacks did not differ in any respect from ordinary cases of this disease; this fact taken in connection with the period of incubation, which will be referred to below, is of considerable importance.

As to the Period of Incubation.—The four cases of typhoid fever sickened exactly seventeen days after the shooting, reckoning to the period when each patient was obliged to take to his bed; so far as one outbreak can be taken as evidence, this remarkable accordance shows that the frequent variation in the period of incubation in this disease does not depend upon the age or state of health of the party attacked, or upon the dose of the infection element taken.

Of the two cases of diarrhœa the one occurred on the third and the other on the twenty-first day after the shooting. The attacks of diarrhœa which sometimes accompany outbreaks of typhoid fever are often regarded as modified attacks of that disease, but bearing in mind the distinct nature of the symptoms and the marked difference in the period of incubation, this can hardly be considered the case in the present instance, and unless we assume (which I think we cannot fairly do) that these attacks of diarrhœa occurring in previously healthy individuals, were merely coincidences unconnected with the other outbreak, we can arrive at no other conclusion than that the same materies morbi may produce two distinct diseases, and that two distinct effects may have essentially the same cause.

As to the Origin of the Outbreak.—As the party had never all met before the morning of the shooting, and never all met after that day, it is certain that the infection was received during the time they were together. The meeting was in the open air, the luncheon was in the open air, not near any house or nuisance of any kind; the country shot over was most healthy in every respect, they did not enter any dwelling, nor did any one of the party drink any water, and I am in a position to state that there was no case of typhoid fever nearer than in a neighbouring town some three miles off. With one exception, to which I shall subsequently refer, the only conditions they had in common during the time they were together were that they all partook of the same food and drink. The food was such as is in ordinary use on similar occasions, and need not be further considered. The drink consisted of beer and perry, of both of which every member of the party partook. I have stated that the party entered no dwelling during the day, but at the end of the day's shooting they did all enter a detached building used as a game house; this consisted of one room open to the roof, but not very freely ventilated; it was perfectly clean, and had not been used since the previous year; it has no drain at all opening into it, and when requiring cleansing, is washed down through the door. There was no nuisance connected with it, and when first entered it was quite sweet; but, as all the party unanimously state, and as some of them forcibly remarked at the time, the room became filled with a most offensive, foul, and unusual odour after the unpacking of a game bag in which nine hares had been carried for two hours on the hot day. This was the other condition to which I referred and which becomes of more importance, as it is to it that the most intelligent of the sufferers attribute their attack; and for me not to mention it in this report would be to clip facts to suit theories.

The evidence as to the conditions to which the party were exposed during the time in which it is certain the infection was contracted is most complete and entirely to be relied upon, and has been checked by myself in every respect by a thorough personal investigation on the spot, for which every facility was afforded me. We are thus driven to conclude either that the disease arose from conditions of a nature which, up to the present time, have not been associated with it, or that the beverages used in common by all acted as the vehicle for the infection. I have adopted this latter conclusion, because, so far as our present knowledge goes, I see no other explanation, and because it is possible, in accordance with recognised theories, to connect the outbreak with these beverages. It has been before stated that the party resided in six houses; five of these were isolated houses in the country, and the sixth in the best part of the neighbouring town, referred to before, and it was from that house that the luncheon was provided. There has been no fever in this house or in the immediate vicinity before or since the outbreak; there was, however, as I am informed by the medical men in attendance, some cases of low fever in a different part of this town at that date. The beverages were beer and perry, and both have continued to be used by this household without any ill effects whatever; they are neither of them of a kind likely to have been surreptitiously mixed with water before being sent to the shooting party, for which, indeed, there would have been no inducement, and there is reliable evidence that the bottles were not subsequently tampered with. The only possible way, therefore, in which the beverages can have become contaminated must have been either from the vessels themselves or from the water with they had been washed. Of the bottles in question which contained some quarts each, one had been used for a similar purpose a few days before, and the other was a stone mineral-water bottle, and had only been recently emptied of its original contents. From the evidence of the domestics obtained before the object of the inquiry was known, it was ascertained that the bottles were carefully washed out with boiling water, and turned upside-down to drain. On this latter point there is indisputable evidence; and, from personal inquiry, I am satisfied that the water was taken from an iron boiler which had had a fire under it for some time, and, if not actually boiling, as is asserted, was pre-

sumably raised to a temperature high enough to coagulate albumen.

We must, therefore, conclude that the contaminating matter can only have been introduced with the water used for washing the vessels. A considerable number of cases are on record in which a similar contamination has been asserted; but all these have been in the case of milk, where there is always room for suspicion either that the milk has absorbed foul effluvia, which it will readily do, or that water has been added to it. The water used was that laid on to the houses in the town, and undoubtedly contaminated at all times, and at this particular time liable to be mixed with the specific typhoid excreta. This town is supplied with water on the not uncommon but vicious principle of a plentiful supply of bad water laid on to the houses and intended for cleansing purposes only, and a separate supply of good water for drinking purposes, brought to public conduits in the streets. The sewage of the town is discharged into a river by two outfalls, one above and one below the town; and it is from between these two outfalls that the town water-supply is pumped up.

The six cases were treated in six different houses; and in no single instance did the disease spread, although one case did not become developed until some time after the patient had returned to resume his studies in one of the largest and most important educational establishments in the country. No stronger evidence could be given of the manageability of the disease when proper precautions are taken.

Space will not allow me to consider fully the probable cause why the very large proportion (six out of seven) were affected, and why the only one to escape was the gentleman from whose house the luncheon was brought, and why,—supposing the above explanation to be correct—instead of a few cases (not more I am told than usually occur there at the same season of the year) a virulent epidemic did not break out in the town, as a very large number of the inhabitants use this same water for various purposes, and occasionally with the indifference of the ignorant, use it for drinking because it is the most accessible. One fact which I have very frequently observed may have had something to do with this comparative immunity, viz., that persons from country districts, newly exposed to typhoid influences, succumb to them, whilst those who have been for a long time exposed to the same influences may remain unaffected, although not actually protected by previous attacks. The contaminating matter also in a river would not be so uniformly diffused as in a well; and a fast-flowing river with a large volume of water might, after receiving the specific excreta, be expected to contain for a short period, until washed past the town, very concentrated contamination in a portion of its stream.

When will the public realise the fact that they may, in many instances, drink dilute sewage for years without producing the specific result of fever, and that, after familiarity has bred contempt, they may be suddenly cut down by an outbreak of this fell disease? Quite lately I found a quantity of soda-water in my district much contaminated with recent sewage, and if the facts of the above outbreak have been correctly ascertained, the possible morbific power of sewage-contaminated water in connection with our ordinary beverages must have assigned to it a far wider range.

Law Reports.

MILK ADULTERATION.

AT Southwark, John Davis, a dealer in milk, 75, Kent Street, was summoned before Mr. Partridge by Mr. Edwards, the sanitary inspector of St. George's Vestry, for selling adulterated milk. Mr. Best prosecuted on behalf of the vestry.—Mr. Edwards said, on November 24 last he caused a half-pint of milk to be purchased at the defendant's shop, and at the same time he told his wife that he was going to have it analysed. He took a portion to Dr. Muter, the public analyst, whose certificate showed that it was adulterated with 25 per cent. of water.—The defendant's wife, who attended to answer the complaint, said that they sold the milk as they received it from the country.—Mr. Partridge fined the defendant 10*s.*, and 12*s.* 6*d.* costs.

ADULTERATED BUTTER.

AT the Southwark police court, Jenkin Jenkins, cheesemonger and egg merchant, 109 Blackman Street, was charged with selling as butter a mixture containing nearly 50 per cent. of foreign matter. Mr. Edwards said that on the same day he caused six ounces of butter, at 1*s.* per pound, to be purchased at the defendant's shop. He divided it into three parts, giving one to the defendant, keeping another himself, and taking the third to Dr. Muter, the analyst. The certificate showed that a great portion was foreign fat otherwise than butter. For the defence it was stated that the article was sold to defendant as a cheap butter, and was much used by the poorer classes of people. Mr. Partridge said if people, of whatever condition, asked for butter they expected butter, and should have it. He advised the defendant and others in the same business to tell their customers that it was a mixture at the time of the purchase. As it was not injurious to health, he fined the defendant 1*s.* and 12*s.* 6*d.* costs. Another such case was disposed of in the same way.

NON-VACCINATION.

AT Hammersmith, Frederic Keen, a dairyman of Walmer Road, Notting Hill, appeared to answer summonses to show cause why he should not produce six children, who were believed not to have been vaccinated. Mr. Shattock, the officer appointed to carry out the Act, said the defendant had been summoned before, but in consequence of the minute of the order not having been served he was requested to take fresh proceedings. On or about August 18 last he left a notice for the children to be vaccinated within fourteen days. The defendant followed and threw the notice at him. The defendant said he had not produced his children. Three of them were at home looking after his business. He maintained that the children were his own property and not the property of the State. Mr. Bridge said the defendant was bound to obey the law. The defendant said only to a certain extent. Mr. Shattock pointed out to the defendant that if he admitted his children were not vaccinated their attendance would not be necessary. Defendant said he was not guilty. Ultimately the summonses were adjourned for the defendant to produce his children.

Correspondence.

THE PROPER FOOD OF MAN.

II.

Is Man naturally a Flesh-eater?

(*To the Editor of the* SANITARY RECORD.)

SIR,—Plutarch appears to answer the above question by asking another, namely, 'why men do not substitute

their teeth for the instrument in slaying the ox, why they do not grapple by dint of bodily strength with the boar, tear and mangle the limbs of the lamb or the hare, and, to be in character, why they do not fall upon and devour them while life yet palpitates in their veins?'

But all that is simply rhetorical. I have promised to treat the subject on strictly scientific grounds—not because I undervalue the historical proofs that man did primitively restrict himself to his proper food, but because, if I show that man, by his physical organisation, was not adapted as a flesh-eater, the historical evidence will be only a matter of course. I therefore begin by putting the horse before the cart.

First, then, as to the comparative anatomy of the subject. The flesh-eating animal—the tiger, for instance—has sharp-pointed canine teeth; no power to move the jaw from side to side; no grinding teeth. 'Such are the jaws and teeth of a carnivorous creature,' says Dr. Lankester in his work *On Food*. Secondly, the herbivorous animal—the horse, for instance—has not long canine teeth, in fact, properly speaking, no canine teeth; the lower jaw is quite movable from side to side; and it has flat teeth for grinding. 'This is the character of the mouth of a herbivorous animal,' says Dr. Lankester. Thirdly, man has no long canine teeth, or, properly speaking, no canine teeth; his lower jaw is movable from side to side; and he has flat teeth for grinding. Hereupon Dr. Lankester observes that 'man *seems* to stand between these two groups.'

Against the above dictum it may be argued that there is no necessity to say what man *seems* to be. The question is—What is he? The human skull is clearly as distinct from those of the tiger and the horse, as these are from each other. There is no reason, therefore, as regards the teeth, why we should not give man the name which naturalists have agreed upon, and call him neither carnivorous nor herbivorous—nor 'something between these two groups'—but decidedly *frugivorous* or fruit-eating. We should then have three classes before us scientifically defined—the flesh-eaters, the herb-eaters, and the fruit-eaters, which will comprise all the animal creation.

And, singularly in accordance with this definition, we have the following declarations of the most eminent naturalists.

Linnæus says:—'This species of food [fruits] is that which is most suitable to man, which is evinced by the series of quadrupeds, by analogy, by wild men, apes, the structure of the mouth, of the stomach, and the hands.'—*Amœnitates Academicæ*, vol. x. p. 8.

Baron Cuvier, who reproduced Aristotle in every way and something more, wrote as follows:—

'Fruits, roots, and the succulent parts of vegetables appear to be the natural food of man; his hands afford him a facility in gathering them; and his short and comparatively weak jaws, his short canine teeth—not passing beyond the common line of the others—and the tuberculous teeth [grinders] will not permit him either to feed on *herbage or devour flesh*—unless these aliments be previously prepared by the culinary processes.'

Gassendi, after a careful comparison of the teeth of man with those of other animals, delivers himself as follows:—

'Wherefore, I repeat, that from the primæval and spotless institution of our nature, the teeth were destined to the mastication, not of flesh, but of fruits. As to what relates to flesh, it is indeed true that man may be sustained on meat; but how many things does man do which are contrary to his nature! Such is the perversion of manners now, by a general contagion enamelled into him, that he seems to have become *a new creature*.'—Gassendi, *Works*, vol. x. p. 20.

Lord Monboddo—decidedly one of the most erudite men of his time, and styled 'paradoxical' because he went beyond his age in generalisation—is most explicit on the subject. He says:

'Though I think that man has, from nature, the capacity of living either by prey or upon the fruits of the earth, it appears to me that, by nature, and in his original state, he is a *frugivorous* animal, and thus he only becomes an *animal of prey* by acquired habit.'

To these authorities on the subject might be added, in a similar vein, the evidence of Daubenton, Sir Everard Home, Ray, Lamb, Bell, and others, all leading to the same conclusion.

And now for the demonstration that these eminent naturalists could come to no other conclusion.

1. The teeth of the mammalia are divided into four series: 1. incisors or cutting teeth; 2. (canines) cuspids, or eye-teeth: 3. bicuspids; 4. molars, or grinders. In each human jaw there are sixteen teeth, consisting of four incisors, two cuspids, four bicuspids, and six molars or grinders. These, in a perfectly normal state, form an uninterrupted series; they are all nearly equal in length, and *closely approximated in each jaw*—a character by which man is distinguished from all other animals, excepting the fossil genus *Anoplotherium*—which is allied to the Tapir tribe.

2. The cuspids or canine teeth have their normal development in the carnivora; and they are so called from *canis*, the latin for 'dog,' because they are well-developed in this animal.

These cuspids or canines, when normal, are longer than the other teeth, conical, acute, and strong; often compressed, and with a cutting edge behind; their number never exceeds one on each side in each jaw. In many animals—as in the boar—they are developed into huge tusks. The cuspids being generally much longer than the other teeth, a considerable space usually exists between the teeth, on each side of the jaw; and in all animals the lower cuspids are anterior to the upper ones.

It is needless to say that there is not the slightest resemblance between the cuspids of man and those of certain carnivorous animals; and yet the possession of these so-called canines is the principal evidence urged by those who contend that man is 'partly carnivorous,' forgetting, or not knowing, that these very teeth are longer in some of the herbivora.

Now, throughout Nature there are no sudden departures from the general type; and an organ which is strikingly characteristic in one class or order disappears by successive gradations through several other orders, until it finally vanishes, or becomes merely rudimentary. Such is the case with the canine teeth. In the carnivora they are strong and powerful weapons of offence and defence; in some of the herbivora—as the horse, camel, and stag—they are still pointed and large; and in man they are small, scarcely longer than the incisors, in a well-formed mouth; and no *space* exists between the opposite teeth for receiving the canines, which is another *exception peculiar to man*. In man, therefore, the cuspids are a form of transition between the incisors and bicuspids, nothing more; and they can have no reference whatever to a flesh-eating adaptation.

If, however, it be said that in consequence of the existence of the canines in man, he must be carnivorous, then, to be consistent, we must say that the horse, the camel, and other species of herbivora are still more carnivorous than man, because, as before intimated, the cuspids are longer in them than in man.

The bicuspids or false molars present no comparative reasoning of any consequence in the discussion; but it is otherwise with the molars.

3. The molars of herbivorous animals have very large or oblong square crowns, not, however, proportionately larger than those of man—but entirely different in structure. They are composed of alternate, longitudinal plates of bone and enamel, and the whole crown is surrounded with a plate of enamel, like the human teeth; the grinding surface, however, is *not* covered with enamel—as is the case with those of the *quadrumana* and man—but presents the uncovered ends of the plates of bones and enamel before mentioned; and these plates of bone being much

softer than those of enamel, wear away much faster in mastication; so that the plates of enamel are continually caused to be more prominent than those of bone, whereby a prodigious roughness is given to the grinding surface, which generally increases its dividing and triturating power upon the grass, twigs, boughs, and other vegetable and woody substances upon which herbivorous animals naturally subsist. Now, the molars in the lower jaw of man—like those of herbivorous and frugivorous animals, are simply raised into rounded elevations, and are directly opposed to those of the upper jaw—so as to grind and mash the substances that come between them—but not in the least adapted for killing, tearing, and gnawing animals. In the carnivora, the corresponding teeth *shut within those of the upper jaw*—so as to tear and cut the flesh on which they feed, preparatory to its being swallowed. When both series are viewed together, the general outline may be compared to the teeth of a saw, and their action to that of a pair of shears—a totally different action to the mere masticating or grinding action of the human molars and those of the herbivora and frugivora.

In my next letter I shall proceed with the other anatomical and physiological reasons for answering the query with which we commenced with a most decided negative.

VEGETARIUS.

GAS.

(*To the Editor of the* SANITARY RECORD.)

SIR,—Will you kindly answer the following questions in your next number?

The gas works in this town are on a higher level than most other parts of the place.

1. What amount of pressure would be required to force gas down, say thirty feet?
2. Would not that tend to leakage?
3. The water of several houses in one street both smell and taste of gas; is there any analysis of the water required beyond that to prove its presence?—if so, what?
4. The soil is said to have been impregnated some years since by the overflow of a tank at the works. Would that continue many years? The general opinion is different, and that the spoiling of the water arises from leakage in the mains. The wells are all shallow.
5. Would it be necessary to have the soil analysed?
6. What are the best books to consult on the subject?

The gas company are about to apply for an Act of Parliament, and the local board are going to oppose it, on the ground of the works being placed in a wrong situation, and on account of the water-supply of this street being damaged.

CAMBRIA.

[No extra pressure is required beyond that usually employed in gas works, in order to supply a street only thirty feet below the level of the works. They would naturally put in a syphon at the lowest point for the collection of the condensed water. No leakage would necessarily result from such a continuation of the service. We should imagine that any analysis of the water which testified to the presence of gas in the water would be sufficient for all legal purposes. There can be no doubt whatever that a soil once well impregnated with gas products will remain in an impure condition for some years, more particularly if the soil be a clayey one. If the tank of a gas works, situated on a high level, were to overflow, the imbued water would very likely find its way by percolation into the wells sunk at the lower level, particularly if the formation was one of fissured rock. As regards the amount of vitiation received by the wells in the neighbourhood of the march of the gas mains, it is certain that if the pipes are subject to leakage, the subsoil water would be sure to be impregnated, and would course along the outside of the pipes, finding its way in all likelihood into the wells through the steining. The handiest work to consult upon the manufacture and distribution of coal gas is that of Mr. Samuel Hughes, C.E., which was published by John Weale in 1853. It contains all necessary information. A gas works should, if possible, be built at the lowest level, as the tendency of the supply is to ascend. The greater the elevation of the main the more brilliant the light, as may be noticed even in a house. Moreover in such a case the evil results of any leakage would be more likely to return direct to the gas works, by way of the trenches in which the pipes were laid. We fear sections and plans or a personal visit are necessary in order to diagnose and advise rightly.—ED.]

Sanitary Invention.

THE SCIENCE OF THE TOILET.

UNDER the name of Poulotine, a fragrant and antiseptic foot-wash, and some variations of it for the purpose of a 'bath-powder' and toilet-soap, have been introduced to our notice, of which we can speak with unqualified praise. The utility of a tonic, fragrant, and refreshing foot-wash for pedestrians, dancers (private and public), and for many of the exigencies of the toilet, seems to have been overlooked. It is, however, certain that an invention such as this, which is likely to be curative of excessive perspiration, to give a perfectly fresh and healthy condition of the skin of the feet, and to make it healthy and fragrant, has a wide and useful field of application.

The active agent employed in these articles is one of great value, and which is comparatively new to science in this country for the purpose. It has many great advantages. Altogether, this invention is one of considerable value, and should form a popular and universally acceptable addition to the toilet. Many additions made to the existing list for the use of the toilet are objectionable or even noxious. This is, on the contrary, in accordance with the best principles of personal hygiene. The bath powder and the toilet soap are refreshing and fragrant, but they will also serve to remove discolourations of the skin and to maintain it in perfect health. They would be found curative of most cutaneous disorders.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

ALLEN, Mr. Alfred, jun., has been appointed Surveyor to the Parish of St. Luke, Middlesex, vice Niblett, deceased.

FARRAR, Charles, M.D. Heidelberg, L.F.P.S. Glasg., and L.M., L.S.A. Lond., has been appointed Medical Officer of Health for the Chatteris Urban Sanitary District, vice Wilson, appointed to the Rochdale Urban Sanitary District.

FROW, Mr. H., has been re-appointed Inspector of Nuisances for the Gainsborough Rural Sanitary District: 12*l.* for one year.

HILLMAN, Mr. John, has been re-appointed Surveyor to the Luton Urban Sanitary Authority.

HORNSBY, Mr. John, has been appointed Surveyor, Inspector of Nuisances, and Collector to the Newbiggin-by-the-Sea Urban Sanitary Authority, vice Bowmaker, appointed to the Houghton-le-Spring Urban Sanitary District.

HORSLEY, John, F.C.S., has been appointed Public Analyst for Merthyr: 10*s.* 6*d.* per analysis, and 21*s.* per day, second class travelling expenses and hotel charges, when required to give evidence.

HUTCHINSON, Mr. T. F., has been re-appointed Inspector of Nuisances for the Leyland Urban Sanitary Districts.

KIRK, Mr. Edwin George, has been appointed Inspector of Nuisances for the Huddersfield Urban Sanitary District, vice Aird.

MALCOLMSON, John Andrew, M.D., C.M. Qu. Univ. Ireland, has been appointed Medical Officer of Health for the Middlesborough Rural Sanitary District: 150*l.* per ann.

OSBORNE, Mr. G. H., has been re-appointed Inspector of Nuisances for the Calne Urban Sanitary District for one year.

VACANCIES.

BURSLEM URBAN SANITARY DISTRICT, Staffordshire. Inspector of Nuisances: 80*l.* per annum. Application, 24th instant, to J. W. Powell, Clerk to the Authority.

CAISTOR RURAL SANITARY DISTRICT. Inspector of Nuisances: 140*l.* per annum. Application, 23rd instant, to the Chairman of the Authority.

SWADLINCOTE URBAN SANITARY DISTRICT, Derbyshire. Medical Officer of Health.

SWINTON URBAN SANITARY DISTRICT, Yorkshire. Surveyor and Inspector of Nuisances: 120*l.* per annum. Application, 28th instant, to Frederick L. Harrop, Clerk to the Authority.

WAKEFIELD URBAN SANITARY DISTRICT. Inspector of Nuisances: 130*l.* per annum. Application, 22nd instant, to Henry Morgan, Town Clerk.

WOLVERHAMPTON URBAN SANITARY DISTRICT. Inspector of Nuisances: 100*l.* per annum. Application, 20th instant, to Henry Underhill, Town Clerk.

WORKINGTON URBAN SANITARY DISTRICT, Cumberland. Medical Officer of Health.

SANITARY PATENTS.

3739. Improvements in the ventilation and water-supply of buildings and apartments. Alexander Melville Clark, Chancery Lane, London. A communication from John Henry Morrell, New York, U.S.

3747. Improvements in syphons for effecting intermittent discharge of liquid from sewage tanks and other vessels. Rogers Field, Cannon Row, Westminster.

2170. Improvements in confectionery or sweetmeats. Robert Coombs, Hackney-wick, London.

3636. An improvement in the moulding of fuel, making it more compact for storage, and also preventing the spontaneous combustion, also giving assisting power in the burning. Elizabeth Marriot, St. John Street, Northampton.

3716. Improvements in double or folding doors, French and similar casements, and in apparatus for securing them against high winds, burglars, and other contingencies. Otto Eugen Lohnstein, Mincing Lane, London. A communication from Clarence Edward Collings, Hong Kong.

ABSTRACTS OF SPECIFICATIONS.

1219. Biscuits. H. W. Hart, Sackville Street, Piccadilly.

This invention relates to the manufacture of biscuits which contain the beneficial properties of tea, coffee, or other similar stimulants, and which are designed to be used under circumstances where it is not convenient or desirable to have such substances prepared in their usual liquid form.

1239. Distilling sea-water. H. Fisher, Newcastle-upon-Tyne.

This invention of an improved mode of and apparatus for distilling sea-water to obtain fresh water therefrom is designed to enable persons in a boat at sea, shipwrecked, or otherwise cast away, to secure a supply of fresh water for any ordinary length of time, by means provided in the boat and capable of being put to work by the power then available. For this purpose a boiler or vessel for containing the sea-water to be distilled has arranged in combination with it apparatus for producing heat by friction for evaporating the sea-water, and apparatus for collecting and condensing in the form of fresh water the resulting steam or vapour.

1260. Boots and shoes. T. Horrex, Gray's Inn.

The invention consists in protecting the feet from wet or damp by means of an India-rubber covering which can be readily adjusted to or removed from any boot or shoe, and which will of its own elasticity fit closely and follow the form of the boot or shoe.

1262. House-sinks. H. S. Snell, Southampton Buildings.

The object of this invention is to prevent the escape of noxious or offensive gases arising from sinks, water-closets, urinals, fitted up in dwelling-houses, into the interior of the house, and to conduct any such gases into the external atmosphere, either by a hole in the external wall of the house, or through a conveniently-placed chimney or upcast shaft.

1490. Funeral carriages. C. Williamson, Leighton Buzzard.

The invention mainly consists of a carriage or conveyance mounted on wheels, such being under the body of the conveyance, the whole of which is to be of such width as to allow it to pass into the church and straight to the grave without moving the coffin. The sides and ends of the body of the conveyance are made of wood or other suitable substitute, and are hinged in such a manner that they all let down, and when in the church the coffin can be seen. Pillars are provided to support the velvet drapery along the body of the carriage with india-rubber rollers inside. A guide is provided for the bearer to take hold of in turning.

1505. Purifying carburetted hydrogen gas. H. W. Cook, Thurloe Square.

The objects of this invention are, to economise the chemical ingredients employed for the purification of gas. To this end the purifying materials (say lime, for instance) are presented to the gas in such a manner that they will act energetically on the gaseous impurities, and will offer continually fresh absorbing surfaces.

1506. Sink traps. J. Middleton, Leeds.

The object of this invention is to effectually prevent sewer-gas from entering dwelling-houses. This result the inventor attains by relieving the water joints of sink and other traps from the pressure of sewer gas, and providing a free escape for the same into the open air.

1516. Warming and ventilating. W. J. Spurrier, Birmingham.

According to this invention air for warming rooms, carriages, and ships, is heated by means of a perforated chamber, heated by a kitchen or other fire-grate, or otherwise heated, the withdrawal of the heated air from the heating chamber and its distribution through the rooms or places to be warmed being effected by a rotary fan worked by a falling weight or otherwise. The exhaust side of the fan is connected by piping with the heating chamber, and the delivery side of the fan is in connection with a system of pipes which may ramify into different parts of a building, the current of heated air being directed and regulated by valves or stop cocks in the system of pipes. For ventilating only, the exhaust side of the fan is put in communication with the external air, the distribution of heated or cool air being determined at pleasure by opening certain of the stop cocks and closing others in the system of pipes.

1525. Catching flies. H. Fellenger, Westbourne Park.

This invention relates to the arrangement and construction of a new or improved trap or apparatus for catching flies, wasps, bees, or other insects. For this purpose a cage or chamber is constructed advantageously of wire gauze or perforated metal, or of glass, wood, paper, or other suitable material. At the lower end or other suitable part of this cage or chamber small passages are formed for the entrance of the flies or insects into the interior thereof, the entrance passage being made in such manner that when the flies have entered they are unable to return, the projecting wire or other means employed acting to prevent them doing so. Within the cage or chamber, honey or other attractive substances or fluids are placed, and when satisfied the flies or insects can ascend or pass through an aperture into another and larger chamber, from which they are unable to pass back again.

1549. Waterproof fabrics. J. Young, Silvertown.

This invention relates to an improved process of vulcanising india-rubber or compounds of india-rubber used for cementing together two textures of animal fibres such as wool or silk to make water or air-proof fabrics, which fibres, if subjected to the ordinary process of heat for vulcanising india-rubber, would be injured or destroyed. The invention also applies to cotton or mixed fibres.

1553. Plates, slabs, or tiles. W. E. Gedge, Wellington Street.

The plates, slabs, or tiles, the subject of this invention, are produced from cements. The cement is first mixed into a semi-liquid state and is then spread upon glass tables. The glass is then beaten with a wooden mallet to render the layer of cement perfectly uniform. The semi-liquid cement is then rapidly hardened by sprinkling with powdered cement, which in a few minutes absorbs the water in the first cement, which is then levelled and smoothened. This product is rendered less brittle by spreading over it a piece of canvas, upon which is placed another layer of liquid cement, and it remains in this state for twenty-four hours, when it is divided into slabs or tiles, according to requirement, which are then put into a stove; when, removed from which, the part which had adhered to the glass is coated with varnish to imitate enamel; they are then again placed in a stove, where they remain for twenty-four hours. When it is desired to decorate the plates, tiles, or slabs, after leaving the stove they are pumice-stoned, decorated, a fresh coating of varnish applied, they are again placed in a stove, and twenty-four hours afterwards they may be withdrawn for use. To produce plates, slabs, or tiles coloured, without pattern, the desired colour in powder is applied to the varnish.

1572. Ventilating. W. Corfield, Clifton.

The improvements consist in connecting to a portable or fixed bellows or revolving fan at the suction thoroughfare thereof a box or receptacle designed for containing and having fixed therein one or more inlet-valves; the connection therewith from the exterior of such box or receptacle to the place to be ventilated is effected by means of metallic or flexible pipes or unions or other similar and equivalent joints; the exhaust or discharge orifice of the said bellows or fan being so arranged that the foul air as extracted may be discharged into a ventilating shaft or pipe or direct into the open air.

1578. Paving. A. C. Adam, Newcastle-upon-Tyne.

The object of this invention is paving streets, roads, and ways by perforating or otherwise preparing the surface, such as asphalte, for the reception of coarse gravel or other body capable of affording a good grip for horses' feet.

1619. Water-closets. B. Haigh, Cubitt Town.

This invention relates to means for preventing the return of the foul gases in the soil-pipe, more especially in the case of ships' closets, for which purpose a valve chamber is placed between the pan and the soil-pipe, so arranged and operated that before the pan outlet-valve is open the soil-pipe valve will be closed, and *vice versa*.

1626. Gas burners. R. W. Rhames, Tinahely.

This provisional specification describes the employment in gas burners of a gauge for regulating the amount of gas which flows through the burner. This gauge is a hollow cylinder formed with longitudinal slits through which the gas has to pass. The regulation is effected by screwing the cylinder more or less into a socket so as to cover more or less of the slits. The provisional specification also describes the employment of a spherical or other form of chamber screwed on over the gauge; this chamber receives the gas as it flows through the slits, and it is provided with a lava tip or other burner.

1631 Fire-grates. S. Russell, Shepherd's Bush.

The features of novelty which constitutes this invention are means and contrivances by which the draught in an open fire-grate may when desired be instantly diverted downwards, whereby great intensity of heat is obtained and the smoke consumed by being carried downwards through the fire. Also means and contrivances by which both the intensity and amount of fire may be varied at pleasure or continue unchanged throughout the day or night without further attention.

1634. Movable grates. H. E. Newton, Chancery Lane.

This invention relates to a novel form of movable grate for supporting the fuel in fireplaces. The grate is made in one piece, and is mounted on an axle, which may be made to oscillate or rock on its centre by means of a hand lever adapted thereto. As the grate may thus be turned on its centre of motion, a sufficient inclination may be given to it, when required, to cause the fuel, pit coal, which is placed thereon to be discharged after it has been converted into coke, in which new form it may be employed for various useful purposes.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer — not necessarily for publication.

Y. Whitehouse.—We cannot learn the address of Mr. Frazer, the patentee of the disinfecting machine you speak of. We are preparing, and will shortly give our readers, a paper upon systematic disinfection.

We have received a communication from the Solicitor to the Gas and Water Company of Ventnor, impugning the accuracy of some of the statements in the report on Ventnor and Bonchurch, page 408. The letter has been referred to the physician who furnished the statements in question, and will appear in our next issue.

MILK IN FOOD AND MOUTH DISEASE.

(*To the Editor of the* SANITARY RECORD.)

SIR,—Will you kindly answer the following through the SANITARY RECORD?

1. Is milk from animals affected with foot and mouth disease fit for human food?—No.

2. Does such milk produce aphthous ulceration in the mouth of the human subject?—Yes; there is much evidence to show that it does.

3. What virus is present in such milk?—'The foot and mouth virus,' whatever that may be.

4. What steps should be taken to prevent the sale of such milk? It should be prohibited, and seized if offered for sale.

5. Who should take the necessary steps?—The medical officer of health or his officers.—[ED.]

DISINFECTING A CESSPOOL.

(*To the Editor of the* SANITARY RECORD.)

SIR,—Will you kindly inform me what disinfectant is the best for the purpose of destroying in a cesspool all danger from a recent case of scarlet fever. The drains leading to the cesspool have been cleansed each day with carbolic acid; but I wish to know what is the preparation which, when used upon a large scale, is effective and yet not so costly as the carbolic sold in solution.

A reply in your paper will greatly oblige. A SUBSCRIBER.

[Common copperas (sulphate of iron) is the most effectual disinfectant known for the purpose described by our correspondent. It should be used in saturated solution, and then some of the solid strewn over the surface. It is very cheap (about 7*l.* a ton), and very effective. It is too dirty for use as a domestic disinfectant, but very valuable for cesspools.—ED.]

HOW TO KEEP BISCUITS DRY.

GREAT minds sometimes condescend to small matters. At a recent meeting of the Glasgow Philosophic Society, after various inventions and apparatus had been described and discussed, Mr. Dickson took the field to explain 'a simple means of keeping biscuits, etc., dry,' which had been prepared by the late Mr. Walter Crum. He said that Mr. Crum appeared to have applied the property which unslaked lime possessed of absorbing moisture to the preservation of biscuits for his family use. The boxes which he constructed, and which were still in daily use, were about nine inches in diameter and about twelve inches deep, having a tray about an inch deep, filled with unslaked lime, resting on a ledge inside near the top, the whole covered with a close-fitting lid. With fresh lime and the boxes not opened for six months the biscuits had remained as dry as when first placed. If the boxes were opened daily, the lime retained its efficiency for from six weeks to two months.

SMOKE-CONSUMING APPARATUS.

THE high price of coal a couple of years since gave an extraordinary stimulus to invention as regards smoke-consuming apparatus. Patentees will soon have to consider whether they will or will not pay the 50*l.* stamp duty for the prolongation of their patents. The following extract from the writings of the late C. Wye Williams may help to guide them to a conclusion. No doubt many inventors deal with smoke as if it were all combustible. Mr. Williams shows that inventions based on this theory can never fulfil the expectations of the inventor:—'It may be well here to notice an error with which we are generally impressed, namely, that the cloudy volume of smoke, as we see it issuing from a chimney, and filling a large space in the atmosphere, is formed of carbonaceous matter. With equal propriety might we say, if we put a few drops of ink into a glass of clear water, and thus give it a blackened colour, that the whole would become a mass of ink. This black cloud is merely the great mass of steam, or watery vapour, formed in the furnace, as already described, but coloured by the carbon; and when we consider that no less than half a ton weight of water (in the expanded form of steam) is produced from every ton weight of bituminous coal consumed, we can easily account for the enormous volume and mass of this blackened vapour called smoke, as it appears to our vision, and the palpable error of supposing that this cloud of incombustible matter was capable of being consumed, or converted to the purposes of heat. Were it not for this mass of steam the carbon would soon fall as a cloud of black dust; but, being intimately and atomically mixed with the large volume of steam from the furnace, it is carried along by the atmosphere, only differing in colour, like the cloud of steam we see issuing from the chimney of a locomotive when in action.'

TYPHOID FEVER IN THE SWANSEA SANITARY DISTRICT.

DR. JAMES ROGERS, in his October Report on this district states that typhoid fever has been very prevalent in the Llandilo Talybont district. Dr. Rogers has not been able to satisfy himself how far any local or specific cause may have led to this outbreak. The conclusion he has been led to points to a large tract of flat, clayey, marshy, undrained land, saturated by the exceptionally heavy rainfall during the past five months, the decidedly unsanitary condition of the great majority of the houses or their surroundings where the fever has been most prevalent—a water-supply open to suspicion, being generally from surface wells, open, and liable to contamination, together with atmospheric conditions calculated to depress vital force in the population generally, and in the individual cases to such a disturbance of the functions as naturally leads to blood-poisoning with its attendant phenomena.

VALUABLE ASSETS.

ACCORDING to a Chicago paper the following were found to be the assets of a New Haven Insurance Company:

	$
Six arm-chairs, $6; 1 spittoon, '25; 1 pail, '05; 1 pair tongs, 10c.	6·40
One washstand, '50; 1 basket, '25; 1 card rack, '50	1·25
One envelope rack, '62; 1 twine box, '13; 1 P. O. box, '25	1·00
Two tin boxes, $1; wetting machines, '25; 1 small press, '50	1·75
Old paper, $1; blank books, $3; 1 stove and pipe, $10	13·00
One map United States, $2·50; 1 map of Connecticut, $2	4·50
One map of New Haven, $2·50; 1 office desk and fixtures, $10	12·50
One long counter and standing desk, $25; pens, '25	25·25
Lot of writing paper, $1; 1 picture, basin, and tumblers, 37c.	1·37
Duster, '05: postage scales, '75; gas fixtures and shades, $8·75	9·55
Lot of curtains and fixtures, $2; 3 portfolios, '87	2·87
Paper clasps, '50; lot of envelopes, $1; 1 ink stand, $1	2·50
One broom, '05; step-ladder, $1·50	1·55
	$83·49

RE-VALUATION OF THE METROPOLIS.

UNDER the provisions of the Valuation (Metropolis) Act of 1869, a return has been issued of the gross and rateable values of the several parishes and unions in the metropolis, as shown by the new valuation lists just completed and sent by the secretary to the managers of the Metropolitan Asylums District, and will come into operation on the 6th day of April, 1876. These returns show the enormous increase in the valuation of property within the metropolis since the first returns made under the Act on November 30, 1870. At that period the gross value of the metropolis was estimated at 24,176,338*l.* 13*s.* 7*d.*, and its rateable value at 19,900,072*l.* 11*s.*, whilst the valuation lists of the present year, just completed, show the valuation of the metropolis now to be as follows:—Gross value, 27,609,062*l.* 12*s.* 10*d.*, and the rateable value, 22,765,676*l.* 10*s.* Total increase in the value of property since the passing of the Act in 1869 of gross value amounting to 3,432,723*l.* 19*s.* 3*d.*, and rateable value of 2,865,603*l.* 19*s.* The way in which these valuations have been made is not very satisfactory, but that is not now the question. The *Builder* gives a few of the separate items: St. George's, Hanover Square, gross value, 1,801,018*l.*; rateable, 1,504,469*l.* St. Pancras, gross value, 1,569,880*l.*; rateable, 1,311,797*l.* St. Maryiebone, gross value, 1,561,519*l.*; rateable, 1,235,231*l.*; Kensington, gross value, 1,524,869*l.*; rateable, 1,271,235*l.* St. Mary, Islington, gross value, 1,405,905*l.*; rateable, 1,158,468. Paddington, gross value, 1,282,945*l.*; rateable, 1,078,700*l.* Lambeth, gross value, 1,263,046*l.* 10*s.*; rateable, 1,034,710*l.* Camberwell, gross value, 699,553*l.* 11*s.*; rateable, 561,708*l.* Chelsea, gross value, 447,843*l.*; rateable, 376,121*l.* Hampstead, gross value, 410,402*l.*; rateable, 339,464*l.* Shoreditch, gross value, 635,443*l.*; rateable 514,903*l.* Fulham Union, gross value, 432,013*l.*; rateable, 351,157*l.* St. Margaret and St. John, Westminster, gross value, 632,419*l.*; rateable, 528,476*l.* Greenwich Union, gross value, 578,760*l.*; rateable, 462,268*l.* Hackney Union, gross value, 878,365*l.*; rateable, 709,473*l.* Holborn Union, gross value, 960,895*l.*; rateable, 790,199*l.* Lewisham Union, gross value, 566,803*l.*; rateable, 472,935*l.* St. Olave's Union, gross value, 908,562*l.*; rateable, 759,395*l.* St. Saviour's Union, gross value, 1,029,293*l.* 13*s.*; rateable, 839,598*l.* Stepney Union, gross value, 358,568*l.*; Strand Union, gross value, 746,357*l.* 16*s.* 8*d.*; rateable, 620,807*l.* Wandsworth and Clapham Union, gross value, 1,085,738*l.*; rateable, 876,983*l.*; Westminster Union, gross value, 806,877*l.*; rateable, 673,366*l.*

EARTH TO EARTH.—The superiority of the London Necropolis (Woking Cemetery) has been specially recognised in the *Times*, and other leading journals, and it is admitted that here only can the burial of the dead be properly carried out. The Company is prepared to conduct Funerals without the intervention of the ordinary undertaker at any stage of the proceedings. Prospectus free.—Office, 2 Lancaster Place, Strand, W.C.

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Original Papers.

DEATH IN THE COAL MINE.

II.

BY JOSEPH NEWTON, A.I.C.E.

ALMOST simultaneously with the appearance last week of our article on this subject came the news of another terrible colliery explosion. It took place at Mons, in Belgium, and more than one hundred poor fellows lost their lives in consequence. The new catastrophe gives a startling and sad emphasis to our remarks, and it ought to induce both the English and the Belgian governments to make renewed efforts for the prevention of such disasters in future.

Legislation has done much in this direction, no doubt, both at home and abroad, and the life of the collier has been hedged round by codes of preservative enactments. These, for the most part, however, have proved nugatory in action, as constantly recurring coal-pit 'accidents' only too painfully demonstrate, and it is manifest that much more remains to be done. If the annual destruction of human life were inevitable, and not to be averted by human means, the fact would be melancholy enough, but when it is known that it is *not* inevitable, and that further precautions would save the lives of hundreds of men year by year, the consideration generates reproach as well as sorrow.

Even with the existing arrangements for the regulation of the collieries of this country, much more might be done in the way of saving life if those arrangements were more stringently and efficiently realised. It is next to impossible, perhaps, for the present comparatively small number of Government inspectors of mines to enforce complete obedience to the plans laid down for the effective and safe working of coal-pits. The causes of so-called accidents are so numerous, and attention to so many minute points of detail are demanded for their prevention, that much must be left to the discretion and, alas! too often to the indiscretion of the workpeople themselves. The inspectors can scarcely be expected to be substitutes for mine engineers or 'viewers,' and these latter might well be augmented in number in almost all the collieries south of Durham. Without efficient inspection no mine can be safely conducted, for the best rules become useless if they exist only on paper or are laxly administered.

In order that inspection should be made as complete and perfect as possible, we would suggest that some system of plotting the coal-fields out into districts should be adopted. A 'district' might be made to embrace some fifteen or twenty mines; and it should be controlled by a chief inspector, with a staff of four or five assistants. These should all be Government officers, selected for their practical ability and knowledge of the work to be done, and for their high moral qualifications. The chief inspectors ought to be mining engineers, well educated, competent in chemistry, pneumatics, hydrostatics, conversant with the principles and details of the steam-engine, and familiar with gas and gas-fitting.

The officers just referred to ought to be placed in positions entirely independent of the colliery managers in their districts, and should be held responsible to the Government alone. Whenever possible the vacancies in each department should be filled up from below, so that the chief inspectors should thereafter be really persons who had risen through the lower grades, and qualified themselves in every way for the more important posts.

It may be urged that this extension of inspectional machinery would be attended with considerable expense, and so no doubt it would. Its contingent advantages would nevertheless far outweigh the cost of the arrangement, and the public would soon find in the lessened annual death-list of coal-getters a sufficient moral compensation for the outlay. Besides, it might be so arranged as that a surcharge of say 3*d.* or 4*d.* per ton at the pit-mouth might be levied, so as to yield a fund for the payment of the various corps of inspectors. A Parliamentary enactment making such a plan of payment binding upon coal owners would not be disadvantageous to the latter, for the public would have to bear the burden eventually. The owners would, in fact, derive increased protection for their men, and have ensured greater safety to their property.

The question of augmented and more adequate inspection of coal mines has been dwelt upon at some length, because it is felt to be one of vital importance, and is, indeed, scarcely second in this respect to that of ventilation.

As has been observed, many of the rules and regulations now in existence and supposed to be in present use are really good, and their realisation by some such course of rigid inspection as we have indicated must be attended—as we think—with the most beneficial results.

It was promised that some points of detail in connection with the economy of coal mining should be touched upon, and these shall now be reverted to.

Foremost among these, and it is to be feared the one most fruitful of fatal results, is the employment of gunpowder. It is needless to observe that the use of this material in coal-pits can scarcely be free from risk, although the greatest care be exercised by those who are entrusted with the 'firing of shots.' The truth is, that, although of late years, many experiments have been tried, and much valuable experience has been gained in connection with blasting gunpowder—both as to its preparation and the mode of applying it—it is a most objectionable agent in coal-mining. The evidence given at the recent and current inquests on colliery explosions goes to confirm this fact. It is not desirable, however, for us to comment further upon this part of our subject pending the inquiry into the cause or causes of the Swaithe Main Colliery explosion. It is certain that gunpowder ought not to be used at all in pits known to be 'fiery,' whilst elsewhere extreme caution should always be observed. Possibly there may be less danger with compressed gunpowder than with the ordinary kind. At any rate, it is obvious that with the former there can be no risk of spilling grains of gunpowder around the mouth of the bore-holes, nor along their inner surfaces where the tamping-rod has to work, nor will the men tread upon grain-powder in the workings. Premature firing of the shots—one great source of danger—is thus avoided; but we repeat it, gunpowder of any kind in a coal-pit is a very undesirable agent.

It may not be improper to explain how it is that explosions generally are so fearfully destructive as they are. Supposing then that a mine is filled with

just that mixture of air and gas which constitutes them an explosive compound, and that then by any chance a light is introduced at a height of one foot or so from the floor. Here it may be that the good air predominates, and consequently no harm is done. Bring the light nearer to the roof and the whole mass takes fire. In that case the persons standing highest are sure to be most burnt, whilst those sitting down are scarcely burnt at all. But now comes another great peril, and too often a fatal one. The sudden explosion has burnt up the air as well as the gas, and nothing remains but a product technically known as 'after-damp'—a deadly gas, and which, by its superior density, has sunk to the floor. The inhalation of this it is which completes the work of destruction, and simply suffocates those who may have escaped the effects of the explosion. The partial vacuum induced by the latter is speedily destroyed by the rush of air from the neighbouring parts of the mine, and consequently the higher position is the safer one after the explosion. The fire-damp can only be got rid of by its dispersion, or removal by a strong ventilating current. These facts are probably known to most intelligent miners; and some of them have, almost miraculously, passed through the scathing and the choking phases of an explosion without more damage than that resulting from fright. Unfortunately the rule is the other way.

Colliers, however, are exposed to many other dangers beside those referred to. In fact, about one-sixth of the deaths occurring annually in the coal mines of this country are recorded in the official reports as resulting from 'miscellaneous' accidents. These comprise crushing by coal tubs, or by passing trains, owing to the galleries through which coal trains pass being too narrow or too low. Some casualties, again, are traceable to the employment of machinery and horses where hand-'putting,' though more costly, would be more safe. Then there is a whole series of casualties constantly happening in the shafts, through overwinding, defectively arranged cages, the falling of materials upon the heads of those within the cages, etc. Many of these may undoubtedly be traced to the recklessness of the men themselves; but it is quite clear that most of them are preventable, whilst others ought to be made impossible of occurrence.

In the mines of the northern districts fatalities of the last-named class, as well as those previously mentioned, are less frequent than in the districts further south. The difference arises, as it appears, from the fact that in the north certain bodies of men are employed for the purpose of 'looking after' the safety of their fellows, and that alone. These superintend ventilation, keep up roads, set timber, attend to the 'propping' of roofs, and to other work of a like character. The matter of propping alone in the southern districts is responsible for many disasters. It is a special rule that 'every collier shall securely *sprag* (or prop) while *holling* (or undercutting it) and shall also, when necessary, prop the roof.' Too often nothing of the kind is done, and hence 'accidents' follow.

It is unnecessary, perhaps, to say more at present upon the various branches of coal-mining, but in presence of the sickening and destructive catastrophes which have transpired recently in reference to it we could not say less. Those who will presently gather round the festive board, and gaze with pleasure upon the cheerful domestic hearth, may take thought in respect of the homes made desolate by the ruthless hand of death in the coal-pit, and ask whether it is still necessary that in ministering to the comfort of Christmas guests the lives of colliers should be placed in imminent and deadly peril?

For our part, we say emphatically that it is *not* necessary, and that the authorities who abstain from resorting to the means at hand for saving the miner's life, and who neglect the teachings of science to the same end, incur an amount of responsibility in which we should not like to share.

THE HYGIENE OF DRESS.

IV.

The Clothing of Women and Children.

WE have alluded to the evil effects of insufficiency in the clothing of women, as regulated by fashion for certain occasions; and the entire subject demands attention on account of its important bearing upon public health, as influenced by that of the mother and her children.

According to Planché, it was in the reign of Henry VIII. that ladies were seen with bare arms for the first time since the epoch of the ancient Romans. From that period downwards, the contest between comfort, common sense, and good taste on one hand and fashion on the other, was waged in favour of the latter, which engrossed every thought. In the reign of Elizabeth the chest or bosom was partially exposed, and so on, step by step, the costume of the court ladies degenerated, until in the reign of Charles II., ladies were seen with bare necks and arms,—and the old starched ruff, the steeple-crowned hat, the rigid stomacher, and the stately fardingale were banished and disappeared, together with the gravity and morality of the wearers.

Several attempts were made in various reigns to check this movement towards an uncovered skin, but with small success, and the laws of fashion continued to force the court lady or fashionable dame to endure the cold and risk of leaving so large a surface of the skin exposed.

In addition to this evil there came tight lacing, rendering the breathing short, exercise consequently a disagreeable labour instead of a pleasant recreation, pushing down the liver out of its place, and injuring appetite and digestion by compressing the stomach, whilst sometimes bringing on alarming palpitations by interfering with the heart's action, and lastly, inevitably producing a red nose.

The physiology of this striking result is explained by Dr. Halton. It is caused by the congestion which occurs in the terminal arteries or capillaries of the skin, by the difficulty the blood has to return to the heart, owing to the pressure round the waist. Precisely the same redness may be seen under the nails and at the finger-tips! And when the congestion continues any length of time, the colour usually becomes permanent.

Very tight lacing has been more or less discontinued—thanks to the reiterated denunciations of medical men, and the dismal examples of its effects, one of which has been recently reported in the papers; but tight lacing is still the fashion, to acquire 'the gentyll body and middle small,' since women persist

in preferring the slim-waisted model of the grasshopper to that of the Venus as depicted or sculptured by the artists of all times—culling their elements of beauty from the multitude, in order to present the ideal perfection.

The notion that stays are necessary for support, has no physiological or anatomical foundation, whilst it is certain that their undue pressure must be more or less hurtful, not only to the organs over which they are extended, but to the *skin*, which they cover tightly, more or less interfering with its function. Of course, habit renders them almost indispensable; and this shows the absurdity of 'staying' the infancy of girls whilst that of boys is left to the freedom of nature.

The use of stays in riding on horseback is especially dangerous; in this case, if they cannot be dispensed with they should be made shorter, so as not to compress the organs that require full play in equestrian exercise. Special corsets or belts are made for the purpose.

But it is during pregnancy that the use of stays may become most dangerous. The ancient Roman lady, as soon as she became conscious of that condition, discarded even her girdle—hence designated *incincta*, as perpetuated in the French term *enceinte*. On such occasions the corset should be suppressed; it compresses the figure, hampers the breast, hinders the secretion of the milk, and the development of the infant; it also opposes the ascent of the gestatory organ, and renders it liable to displacements which may be followed by countless evils to the mother. 'Such, however, is the tyranny of fashion and custom,' says Dr. Paul Trière, 'that it is impossible to bring the generality of women to their senses on this subject; they ought at least to wear the corset as small as possible, to prevent all pressure where it is dangerous, and it should be elastic, in order to yield to the uterine development in all its stages.'

All the other garments of the expectant mother should be ample, warm, and light; and all should be suspended from the shoulder rather than fastened round the figure. In fact, the vestimentary hygiene of pregnancy is comprised in one word, 'freedom.' 'Fashion and its futile exigencies,' adds Dr. Trière, 'are not to be called in where a human being is in process of formation,—a serious art, if ever there was one. To place at ease the product of conception and the organs charged with its nourishment, such is the law which should preside over the toilette of the expectant mother, and it should do away with the false conventionalities that keep the other sex so rigidly enthralled.

Equally important is it to attend to the vestimentary hygiene of infancy; for improper clothing may injure the best natural constitution in the infant, whilst many a natural defect may be remedied by due attention to its clothing and general disposal. Doubtless most of the infantile imperfections which induced the ancient Spartans to destroy their children immediately after birth, might have been remedied by following the dictates of infantile hygiene, as now inculcated and presented to considerate mothers.

Warmth is the first requisite for infants. Young children, in common with all other young animals, are very susceptible of cold. The exposure of their bare legs and arms to a temperature which would cause discomfort to the healthiest adult, is therefore not likely to promote their physical well-being. It is, in fact, a most foolish and mischievous piece of cruelty, whatever fashion—which evidently ignores physiology—may say to the contrary.

The clothing of the infant should be light and warm, and free from pins. Its purpose is to protect the infant from chills, or rather, to prevent too great a loss of the heat which it produces. Hence the impropriety of the old 'swaddling-clothes,' which were designed by mothers to enable them to keep their infants motionless and adapted to be set down anywhere in some corner, whilst they attended to their household duties.

The clothing of infants should be ample enough to prevent any pressure on the blood-vessels, which would impede the circulation and hinder the free development of the members. It should be especially easy over the chest and the figure, in order to ensure the free play of the lungs and the heart; and it should be equally ample around the stomach and the intestines in order not to interfere with digestion. The sleeves should be wide, in order that the garment may be easily put on, and to favour the circulation of the blood in the arteries and veins of the arms.

Instead of swaddling clothes, which still exist, Dr. Trière recommends a large flannel garment, long and full, reaching about six or seven inches beyond the feet and hands, so as to admit of its being tied at a certain distance from the hands and feet. Thus disposed of, the infant will be able to move its legs and arms with perfect freedom, and to turn or roll as it pleases in its bed, and it will not be exposed to nocturnal chills, to which it is so liable.

Dr. Trière objects to flannel next the skin in the case of infants, on the ground that it keeps up a continual state of moisture, which becomes a source of exhaustion, besides rendering them too 'tender' or impressionable to the variations of temperature. Dr. Trière is a great authority; and, therefore, we could wish to accept all his inculcations; but we fear that our damp, cold climate necessitates the use of flannel for infants, with the precaution of preventing too great an elevation of temperature, which might be attended with the consequences which he alleges. In removing an infant from one room to another, a square piece of flannel should be thrown over its head and shoulders.

The ordinary robe of the infant should extend beyond the feet; but not so long as it is commonly seen in England. This garment should be only long enough to preserve the infant from cold by means of its lower folds, but should not constitute a burthen. 'It is astonishing,' says Dr. Trière, 'that English good sense does not revolt against a practice so foolish and so barbarous.'

The doctor, however, admits that we show more sense and judgment by not covering the heads of our infants. 'The cap heats the head, attracting to it too much heat and an afflux of vital movements to which it is but too much disposed. Sometimes the cap compresses the head; and certain cerebral affections have been, apparently with good reason, referred to this cause alone.' By covering the heads of infants we render them more impressionable to the changes of temperature; so that they frequently catch cold by being merely removed from one room to another. Of course, if infants have been used to caps, it will not do to discard them abruptly; this may be done by making the caps thinner and scantier, until a spell of equable weather permits the change to be effected without danger of catching cold.

The garments of the infant should be carefully

aired every day. Exposure to the open air is necessary, to free them from all the impurities which are the product of the cutaneous secretion.

The oftener the baby has a change of linen, the more it will contract those habits of cleanliness which will not only be a benefit to itself, but a joy to the mother, and an important saving of linen and clothing.

UNINHABITABLE LONDON.

Castle Alley, Whitechapel.

II.

WE called attention, some weeks ago, to the proceedings of the Whitechapel District Board of Works, in dealing with a very unhealthy locality, Castle Alley.

It has been several times condemned as unfit for human habitation, by the medical officer of the board, Dr. Liddle, the well-known sanitary reformer; and again in May, this year. It was then referred to the surveyor to report upon.

After an unexplained delay, the surveyor's report was brought before the board a few weeks ago; it agreed with that of the medical officer, and the owners and landlords were then summoned to appear before the board. A formidable array of them, with their surveyor and solicitor (who is likewise the vestry clerk of Whitechapel) did appear.

As they have always done before, so again, they asked for delay; spoke of the large sums of money they were always spending on the property, and of how they were ready to spend more. A number of members of the board, however, had visited the locality that morning, and although it had been cleaned for their inspection, they were much impressed with its most wretched and unhealthy character, and showed a disposition for summary proceedings.

It was moved and seconded 'that the board proceed to put Torrens's Act of 1868 in force, with a view to demolishing the houses, and then acquiring the ground for a new street or other public improvement.'

This, however, could not be done at once, for it was found that the surveyor had not in his report complied with the terms of the Act, not having stated in what respect the houses were structurally unfit for habitation, whether they could be made fit, and if so, how it should be done—or if they must be demolished.

Eventually the matter was adjourned for two months, the clerk and surveyor to take steps, so as then to bring it before the board in some practical form.

It appeared in the course of the discussion, that one landlord paid a rent of 70*l.* a-year for thirteen houses. Three of these houses had six rooms in each, and the family in each room paid three shillings a-week rent; in one of these houses five of the ceilings were falling in, and only kept up by boarding; the rain soaked through the house.

The other ten belonging to this landlord were smaller houses.

An extract from the report of one of the medical officers of the union, Dr. Sequira, was read, stating that he has never been able to return a clean bill of health for Castle Alley; that he had had under his care, in proportion to the number of houses, more cases of sickness there than in any other place in his medical district. Although cases of fever, scarlet-fever and febricula are of frequent occurrence, yet cases of consumption, scrofula, and tuberculous diseases, which in his opinion are either caused or aggravated by the continual breathing of vitiated atmosphere, have been numerous. In view of this expression of medical opinion, the most ardent defender of vested interests can hardly maintain that a landlord like the one holding thirteen houses in this alley, should be treated very liberally.

There seems to be a growing disposition in East End parishes to put the law in force against such persons; the medical officer of the Mile End Vestry has lately reported on Cottage Court, Stepney Green, recommending summary proceedings under the 1868 Act.

We intend to place before our readers the result of the action taken in this case.

It should be noticed that, if the local authority is dilatory in their work, as Whitechapel appears to be, it is provided in clause 13 of the Act that, when more than three months elapse after the medical officer's report without anything being done, the four householders who signed the first representation can memorialise the Home Secretary, and he may direct the local authority to proceed under the Act.

THE
SANITARY RECORD.

SATURDAY, DECEMBER 25, 1875.

The Editor will be glad to receive, with a view to publication, announcements of meetings, reports of proceedings, and abstracts or originals of papers read before the members of any sanitary or kindred association.

ANOMALIES IN PUBLIC HEALTH DISTRICTS.

THE sanitary organisation of the country—if it deserves that name—which was called into existence by the Public Health Act of 1872, and is only permissively affected by that of 1875, is only tolerable, because it is a manifest improvement upon the sanitary chaos that preceded it. Previously to 1872 responsibility in health matters was unknown in a large part of the country, because it did not legally exist; now, at any rate, there is no corner of England and Wales without a sanitary authority, urban or rural, upon which legal responsibility is fixed. These sanitary authorities number nearly 1,600, and vary as to area and population within the very widest limits. There are urban sanitary districts with populations not exceeding a few hundreds, whereas the populations of others range upwards to half a million. The average population of the urban and rural districts is about 15,000 persons. The slow rate of sanitary progress in many parts of the country, the impossibility of getting efficient medical officers of health or earnest sanitary authorities

for a large proportion of the smaller districts, affords conclusive evidence of the urgent necessity for the ample employment of the powers conferred upon the Local Government Board by the Public Health Act of 1875, for consolidation of sanitary districts by the alteration of areas, and for the formation of combined districts. Under section 270 the Local Government Board has power, by provisional order, to dissolve, merge, or enlarge any local government district. Under section 286 any two or more districts, situated wholly or partially in the same county, may be united, by order, for the purpose of appointing a medical officer of health, provided that no urban district, containing a population of 25,000 and upwards, shall be included in any union of districts without the consent of its local authority.

There are no parts of England in which the evils arising from the want of real sanitary organisation are more patent than in the manufacturing and mining districts of Lancashire and Yorkshire, where the rapid increase of urban population has led to the formation in recent years of a host of local board districts, each of which became, under the Public Health Act of 1872, a separate sanitary authority; this unnecessary multiplicity of authorities stands in the way both of efficiency and economy in sanitary matters. As an example of the present sanitary medley, as to authorities, etc., existing in these two counties we cannot do better than instance the case of the Union of Ashton-under-Lyne; not because the case is stronger than many others that might be cited, but because the Registrar General, in his last Quarterly Return, called attention to the strong evidence of unsanitary condition furnished by recent figures for this town and district. Further, these remarks gave rise to a letter published in the *Times* from the medical officer of health for a portion of the union or district, exposing the complete failure of its sanitary organisation.

The union and registration district of Ashton-under-Lyne has an area of nearly 40,000 acres, or about sixty square miles. Its population, which was 134,753 in 1861, declined to 130,626 in 1871, since which it has probably again increased. The annual death-rate during the first nine months of this year in this population averaged 29 per 1,000, and 15 per cent. of the deaths were referred to the seven principal zymotic diseases. In the town of Ashton the death-rate in the three months ending September last was so high as 37·2 per 1,000, and the zymotic rate 14·1 per 1000, of which 7·9 was due to diarrhœa. Let us now consider the sanitary organisation which prevails in this union or district, consisting, as it does, of eight urban and one rural sanitary authorities. The municipal borough of Ashton-under-Lyne had a population of 31,984 persons in 1871, the town council is the sanitary authority, and according to the most recent available source of information, there is a medical officer of health at a salary of 50*l.* per annum. The local board district of Dukinfield had a population of 14,085 persons in 1871, and the members of the local board constitute the urban sanitary authority; Mr. E. Robinson has lately informed the world how he was dismissed from the post of medical officer of health (his salary having been 25*l.* per annum) because he would not co-operate with his authority in doing nothing, where so much sanitary work wanted doing. Part of the borough of Stalybridge, with a population of 12,244, is situated within this union; the medical officer of health for the whole borough has a salary of 35*l.* Droylsden, a local board district with 6,768 inhabitants, is another urban sanitary authority with a medical officer of health who receives 25*l.* a year. Part of the local board district of Mossley, with a population of 5,725, is included in the union, the medical officer of health of the whole district receiving a salary of 20*l.* The local board district of Hurst, with a population of 5,344, has a medical officer of health who is paid 16*l.* per annum. The two remaining urban sanitary districts within the union are the local board districts of Denton and Lees, having a population of 5,117 and 2,919 respectively; so far as we have been able to ascertain, neither of these districts have appointed medical officers of health. Thus the union of Ashton-under-Lyne had in 1871 a population of 84,186 persons living within two municipal boroughs and six local board districts, each of which by the Public Health Act of 1872 became separate *urban* sanitary districts. Deducting this urban population from the total population of the union, there remains an area with a population of 46,440 persons not included within any borough or local board district, which was therefore constituted by the same Act the *rural* sanitary district of Ashton-under-Lyne, with an authority consisting of the poor-law guardians representing the parishes comprising this area. We have been unable to learn that any medical officer of health has yet been appointed for this rural sanitary district, although such an appointment may have been made since the publication of the last available list of such appointments. It should be stated that the list of local board districts in Ashton-under-Lyne is derived from the last Census Report; since 1871 it is quite possible that their number has been still further increased. It is much to be regretted that the Local Government Board has never published an official list of sanitary districts, and of medical officers of health.

It is easy to see how utterly unfitted is such a patchwork of authorities to reform the sanitary condition of the union and district of Ashton-under-Lyne. There are two ways of dealing with this want of organisation. Under section 286 the Local Government Board might form a combined urban and rural district for the purpose of appointing one medical officer of health, and draw up regulations to

govern his appointment and removal. This would at any rate secure for the district an independent medical officer of health who, at but a slight increase of expense to the ratepayers, could receive a salary that would enable him to devote his whole time to the duties of the post. The present system which necessitates the appointment of nine m edica officers of health engaged in private practice for the union or Ashton-under-Lyne, and allots to each a nominal salary is a mere pretence at carrying out the spirit of the Public Health Acts of 1872 and 1875. The 171*l.* per annum paid to the six medical officers of health in the union of Ashton-under-Lyne, before mentioned, is either too much or too little; it is too much if there exists a kind of tacit understanding that no sanitary work is to be done, and far too little if there exists an earnest desire to improve the sanitary condition of the union.

The other, and by far the more satisfactory way to deal with the manufacturing and mining districts of Lancashire and Yorkshire, of which we have taken the union of Ashton-under-Lyne as an example, would be to apply the powers conferred by section 270 of the last Public Health Act upon the Local Government Board, and to merge a number of these small sanitary districts into one local government district for health purposes. Much more is to be hoped from the creation of larger sanitary districts, than by a mere combination of the districts 'for the purpose of appointing a medical officer of health,' who is hampered in his duties by having to deal with a number of small independent authorities. There would be more sanitary work done under combined representative sanitary authorities than under the present system of needlessly multiplied authorities. We wish we could see reasonable cause for hope that the Local Government Board intended to carry on the reduction of the present sanitary disorganisation to something like a system of order and efficiency, the power to do which they undoubtedly possess.

Notes of the Week.

THE Halifax Town Council have resolved that the plant, live stock, carriages, tools, and implements of every description, belonging to the Goux Manure Company in Halifax, should be purchased for the sum of 3,500*l.*

A RETURN to the House of Commons, procured by Mr. James, M.P., has just been published of offences, during five years, against the Vaccination Act of 1867 for neglecting to have children vaccinated, and refusing to obey the orders of magistrates in regard to vaccination.

IT is stated that the Board of Trade has now under consideration the advisability of creating a new appointment, namely, Inspector of Life-saving Apparatus, whose duty it would be to visit the various life-saving stations around the coast, to inspect the rocket apparatus, and report upon the efficiency of the brigades.

THE *Bath Express* states that the London School Board has bought the right of using in their schools Mr. Tobin's system of ventilation, the amount paid being 250*l.*

THE Smethwick Local Board having received a communication from the town clerk of Birmingham stating that he was instructed to take proceeding against the board in order to put a stop to a nuisance occasioned by the pollution of the Aston and Hockley Brook as it flows through the borough, unless within a week the board gave an undertaking to abate the nuisance, a special meeting of the board was convened, and it was decided to give the undertaking required. Mr. Bramwell, C.E., has been retained by the board to advise and assist them in carrying out a system of sewering for the district.

INCORPORATION OF BRIGHTON AND HOVE.

THE inhabitants of Brighton and Hove have shown great good sense in merging their differences of opinion into joint action for the public good of the town of Brighton. It appears that a proposal has been set on foot for the incorporation of Brighton and Hove in one municipal borough, and meetings have been held in both places to discuss the subject. The meeting at Hove was strongly averse to inclusion in the borough of Brighton. The Brighton meeting was as strongly in favour of it, and a suggestion by Alderman Mayall that the two governing bodies should meet and confer amicably, and that the money that would otherwise be spent in litigation should be employed to purchase a public park as a memorial of the friendly union of the two portions of the town, was cordially accepted.

COOKERY FOR THE WORKING CLASSES.

ON Saturday last, prizes were distributed by Mr. Buckmaster to the children of the school recently established at Croydon for teaching artisan cooking. The class was instituted about four months ago, and consists of twelve children, who meet every Saturday morning. It is superintended by ladies who have been through a course of lessons at the National Training School for Cookery at South Kensington, the object being to give a thorough knowledge of cooking such food as comes within the means of the working classes in a cheap and attractive form. On the prize-giving day a number of dishes were placed on a table for inspection by the company assembled, and Mr. Buckmaster highly complimented the girls on their culinary productions, which were readily purchased by the visitors to take away as specimens of what the pupils could do. After the first outlay in fitting up the kitchens, the cost of conducting the school has been comparatively small.

THE LONDON WATER COMPANIES.

A NOTICE, signed by Messrs. Dyson and Co., parliamentary agents, states that it is intended to introduce next session a bill to provide for the transfer to a Royal Commission of the powers and property, duties and liabilities of the metropolitan water companies (the New River Company, the East London, the Southwark and Vauxhall, the West Middlesex, the Lambeth, the Chelsea, the Grand Junction, and the Kent Waterworks Companies), the winding up and ultimate dissolution of these companies, the payment of annuities to the shareholders of the companies by way of consideration for the transfer of their property, and the payment of compensation to their directors and officers.

The Southwark and Vauxhall Water Company are promoting a bill to 'extend the limits of the company for supplying water to all or certain parts of the following parishes, districts, or places, or some of them (that is to say), Putney, Wimbledon, Roehampton, Barnes, Mortlake, Sheen, East Sheen, Kew, Richmond, Petersham, and Ham, all in the county of Surrey.' The bill also proposes to authorise the construction of new waterworks at Richmond.

DIARRHŒA IN DARMSTADT.

We notice in no. 166 of the *Notisblatt des Vereins für Kunde zu Darmstadt*, etc., an interesting table of the ality during September last from various diseases, at en towns in the Grand Duchy. The deaths from œa alone, which amounted to sixty-two, were a sixth whole. This high diarrhœa death-rate, which is times greater than that of London during the same n, and the unequal manner in which these deaths, ll as deaths from phthisis, convulsions, and brain s, are distributed among the thirteen towns, suggest sirableness of an inquiry into their sanitary con-

SALTING THE ROADS.

are very sorry that the Hampstead Vestry have re- ermission to the secretary of the London General s Company to salt the roads in that parish along the company's omnibuses run, during frosty weather. efusal, however, cannot be long maintained. We lways supported this proceeding, the alleged scien- nd medical reasons against it being mere superficial alf-informed twaddle. Experience in Marylebone has d the practicability and success of the proceeding. ed it is obvious that whatever facilitates the running omnibuses must equally facilitate the traffic. To salt the snow and dissolve it, and then sweep it down the drains, is the only rational and economical way of dealing with it. But if this company, for private reasons, do public work by salting the snow, the parishes should, out of their 'able-bodied poor,' find road sweepers for the nonce.

HEALTH OF IRELAND.

THE Registrar General's Return for the third quarter of the year, 1875, shows 19,289 deaths registered in Ireland, the population being estimated at a little over 5,300,000 souls. The rate of mortality was somewhat above the average for that quarter of the year. Scarlet fever, though continuing to decline, was still very fatal and prevalent, and caused 788 deaths. The greater part of this mortality occurred in Ulster, and the same remark applies to the 212 deaths from measles; adding also Ulster's 131 of the 328 deaths from whooping-cough, we find that no less than 846 of the 1,328 deaths from these three zymotic diseases occurred in that province, which, however, has not very much more than a third of the population of Ireland. It was the season for diarrhœa, and there were 583 deaths from that disease and 598 from fevers. The Return bears testimony to the good results of works of improvement effected in various districts under the provisions of the Sanitary Act, and generally the willing co-operation of the people in measures for promoting cleanliness and health. The Registrar General states that emigration has decreased greatly; the returns show that the emigrants from Irish seaports in the quarter under review were 13,033, which is fewer by 4,655 than in the corresponding quarter of the preceding year. There is also to be noted a decrease in pauperism; the workhouse inmates showing an average of 41,342, a decrease of 442, and the out-door average 28,467, being 146 below the return for a year before. The rainfall of the quarter at Dublin was 8·569 inches, or a little less than the quarter's average for the last five years; and the mean temperature was 58·9°, or a little above the average.

INFECTION WITHOUT ISOLATION.

THE district of Skelton has been visited by Dr. Thorne Thorne on behalf of the Local Government Board, and a report was read at the last meeting of the Skelton Board of Health on the sanitary condition of the district, and the best measures to be adopted for preventing the spreading of scarlet fever, and the occurrence of enteric fever. The medical officer of health reported that scarlet fever was chiefly spread 'by persons visiting their sick neighbours, and thus carrying the germs of the disease from house to house.' The chairman observed that this could not be prevented, and the committee reported that they regretted that no hospital accommodation had been provided for cases of an infectious character, and did not see how the local board could amend the evil. Isolation of the sick is not, therefore, to be carried out in this infected district.

The alterations in the drainage recommended in the report show that there is much room for improvement, and they appear to be satisfactory in most instances, but one recommendation is so fraught with future mischief that it should not be passed by unnoticed. After advising the substitution of glazed for unglazed drain pipes, the ventilation of the sewers by open gratings, they also 'recommend that where practicable, the down-comers from the roof of any house should be connected with the drain in that yard, so as to form another ventilator, discharging at a high level any noxious gas therein.' This plan of ventilating sewers had, we thought, been exploded by this time, as it is well known that the joints of the rain-water pipes—called here down-comers—are always more or less open, and would allow the escape of sewer gas, and its probable passage into the nearest open window. But if the joints were all good, as a rule the top of the pipe is so little above, and indeed is so frequently below the top upper bedroom windows, that the escaping gas would often cause that injury to health which its connection with the sewer was intended to prevent. We have known an instance of typhoid fever breaking out on several occasions in a large public institution, which ceased after the direct communications between the rain-water pipes and the sewers were cut off. The report contains a suggestion which cannot be too extensively known or too frequently acted upon, viz., that whenever the sink in the kitchens or wash-houses is connected with the yard drain, such connection should be discontinued, and the pipe leading into the sink open on to a trapped inlet to the drain, and thus prevent the sewer gases from getting into the houses. Medical officers of health and inspectors of nuisances very frequently meet with the concurrence of fever and kitchen-sink drains connected with a sewer, and are therefore accustomed when fever breaks out in a house to examine the sink drains almost before anything else.

PROPOSED EXTENSION OF THE METROPOLITAN DRAINAGE SYSTEM.

THE Metropolitan Board of Works have to be congratulated, as well as the districts concerned, on a change in their opinion as to the capabilities of the main drainage system. Some years since, when the Tottenham authorities wished to connect their drainage with the Metropolitan Board's sewers, they were informed that the sewers had not been constructed of sufficient size to admit of more drainage being carried into them than that from the Metropolitan area. The Tottenham drainage, therefore, after a so-called purification, continued to empty itself into the river Lea, after the passing of the River Lea Conservancy Act, and has caused considerable damage to the river, and threatens to produce serious injury unless the process of disinfection now used at the Tottenham works should prove more efficacious than that adopted before the present year. The Metropolitan Board have taken a sum of money from South Hornsey, to allow that district to be drained into the main drainage system, but have no sewers into which the South Hornsey authorities can drain part of their district, unless they make a long length of sewer, or connect their drains with the sewers of the Hackney district. It is now stated that 'the Metropolitan Board are endeavouring to meet the wishes of the sanitary authorities interested in the proposed admission of the sewage of the district of West Ham and other places in the Lea valley into the Metropolitan system.' The report we have seen does not refer to Tottenham, but it is to be hoped that arrangements will be made for that drainage being diverted from the Lea.

It also appears that the Metropolitan Board is in communication with the Hornsey Local Board on the same subject, and that their letter has been referred to the surveyor of the Hornsey Board. The Enfield Local Board have also been written to, but as they have absolutely disposed of their sewage for a period of twenty years, they cannot entertain any such scheme for the present. There can be no question as to the necessity of affording a proper outlet for the drainage of these districts, as injury to health has already accrued from the foul state of the Lea.

The letters from the various local authorities were referred to the Works and General Purposes Committee, so that we may expect to hear in due time as to the conditions on which the schemes will be carried out. As regards the Hornsey district, we suppose it must be for the purpose of obtaining some modification of the arrangements made for its drainage in the Act of 1874. In justice to the metropolitan ratepayers we expect that financial provisions will be inserted in any Acts which may be passed for these purposes similar to those which are contained in the Acts sanctioning the connections for Hornsey and South Hornsey. These were, firstly, that a sum should be paid as a contribution towards the cost of construction and maintenance of the main-drainage system up to the passing of the Act; secondly, that an annual rate shall be payable similar to that in the metropolitan area, towards the repayment of the sums borrowed for the main drainage of the metropolis; and thirdly, another rate for the cost of maintenance of the metropolitan board sewers. In this way the metropolitan ratepayers will receive a benefit as well as the districts to be drained.

DISTURBANCE OF OUR ROADS BY THE FREQUENT LAYING OF PIPES.

ATTENTION has been called by a ratepayer during the past week to the apparently unnecessary opening up of the public roads after just being carefully macadamised and gravelled. It appears that early last summer the Earl's Court Road had been admirably renewed as far as granite and gravel could serve, and within a few weeks of the rolling process, a trench was dug along it for the accommodation of some large-sized gas-pipes. A short time afterwards an adjacent road, the Pembroke Road, was similarly macadamised, and the authorities have just completed laying on another row of gas-pipes in the formation. The road through Kensington was also renovated in the autumn, and considerable care taken to make a hard highway, and at the present moment it is being dug up in order to bury a similar set of new pipes. This is, he is constrained to think, very unsatisfactory for both the resident ratepayers and for those who are obliged to travel over the roads—for not only has the former to contribute to the double expense, but the latter often finds his horses thrown down and his vehicles upset upon the cambered surface under which the pipes have been stowed away. He is inclined to think that there is a want of union or combination among the authorities who are empowered to open the roads, and this is very possible, and this will, he thinks, continue to obtain in the metropolis until the Board of Works are fully empowered to compel a reasonable use of the roads and are able to inflict commensurate penalties upon those gas and water companies which so disregard the public interest and convenience. The contractors profit by the amount of work to be done, there can be no doubt; but he hits the mark very fairly when he points out that the gas-pipes might be better dealt with than being laid in the earth where leaking pipes are difficult to find—the gas companies regulating the price of their gas by their profits, and the latter being in no way bound by a due economy.

Were it a matter of compulsion for all the gas and water companies to make use of proper subways wherein to lay their pipes—at least in the main thoroughfares—no doubt a great deal of good would ensue, and there would be a chance of securing gas-tight joints, whilst the danger resulting from an occasional escape of gas might be minimised, if not removed, by a perfect ventilation of such underground channels. In Dr. Richardson's 'Model City of Health,' the houses were built upon arched subways, and the gas and water mains were conveyed along them, entering each house from beneath—the companies' officers having admission to them at all times, and finding the system easy and economical of action. We cannot, of course, carry out this idea in London, where the houses are already built to last the century, but we certainly might in many cases construct subways for the services in the roads, as in some places abroad.

The question arises whether or not our roads should have a coating of binding sand upon the macadam, or whether we should not use rollers sufficiently heavy to lay the broken stones in their clean condition. Engineers are by no means agreed as to the propriety of spreading dry road scrapings, or sand, or gravel over the macadam, and until they are, the authorities can scarcely be blamed. It is questionable whether a good road cannot be got without turning it into a kind of solid rock, by metalling it first and crushing into the insterstices with steam rollers limestone chippings and gravel, which convert it into something like concrete. Nor can we be certain that it would be wise to lay the pipes down during the formation of the road, as the joints would be certain to be disturbed in the process of rolling. The macadam of our roads, too, is rarely more than six inches in thickness, and the pipes being at some considerable distance further down, the disturbing of the coating costs little in comparison with the digging of the trench and the subsequent filling in. What ought to be done is to lay tolerably large pipes of each kind down when the road is first formed, with proper branches to the future houses and streets.

The Health of Watering Places.

VENTNOR AND BONCHURCH.

IN reference to some of the statements contained in the report on Ventnor and Bonchurch, page 406 of the SANITARY RECORD, we have received the following letter from the solicitor to the Ventnor Gas and Water Company, which we publish in full; together with the reply of the physician who furnished the statements impugned.

(*To the Editor of the* SANITARY RECORD.)

SIR,—I am instructed by the Ventnor Gas and Water Company to communicate with you on the subject of an article on 'Ventnor and Bonchurch' which appeared in your paper of the 4th inst.

I have nothing to say upon the preliminary part of the article, but from the latter part of the second column of page 408 your strictures are not only founded in error, but are, in many instances, absolutely and (as must be apparent to anyone with local knowledge) wilfully false. There is, for instance, no truth in the assertion that there is an insufficiency of water for the needs of the inhabitants. It is notorious that there is a profusion of water, and that (save for two hours of an evening) it is always under pressure except when turned off for repairs—a circumstance which very rarely occurs. There is not a shadow of pretence for saying that sewer-gas has ever been found in the water-pipes. There are some few houses where the supply to the water-closets is from the main; but although that mode is open to objection, there is no possible communication between the water-pipe and the sewer; and it is a gross libel to say that the water-pipes have ever been known to emit foul air.

You pass on to say that the streets cannot be properly watered through the excessive cost of the water; but I

must tell you that for watering the streets of the town proper the water has always been given in abundance by the company, and that not one penny has ever been paid for it. A few years ago the company constructed a reservoir, into which they pump water by steam, to supply a few houses on the higher levels of Bonchurch, and they have made a charge of sixpence per cartload for water taken from that reservoir; but this applies to the watering of one road only, and that really outside the town.

Then, again, you allege that water was not at command for extinguishing the recent fire; while the fact is that an inexhaustible supply was immediately (and is always) available, for the main passing the house is never turned off. In the particular case alluded to, I believe the fire-engine tackle of the local board was faulty.

Touching the alleged deficiency of supply to the hospital, the author of the article, knowing so much, must also have known that the cause of the apparent deficiency in the supply was discovered to be an enormous leak in the pipe from the boiler of the heating apparatus through which the water escaped into a fissure in the ground as fast as it was supplied. There is no street in the town without a water main. The cost of the water is tenpence in the pound on the rating.

There are many other points in the latter part of your article which might well justify further comment and refutation, but I forbear for want of space. The eye and mind of a practised critic cannot fail to discover the strong animus pervading it, which is the only circumstance to mitigate the atrocity of the series of libels it contains.

T. HAMILTON URRY,
Solicitor to the Ventnor Gas and Water Company.
Ventnor, Dec. 14, 1875.

This communication which the Ventnor Gas and Water Company have instructed their solicitor to draw up does not coincide with the report in several not unimportant particulars. It would appear, however, even from this communication, that with all its natural advantages the water-rate of Ventnor is tenpence in the pound, exactly that of Marylebone; and that the water-supply is only intermittent to the extent of two hours every evening, thus securing all dangers which are inherently possible from the intermittence of a water-supply. As to the several facts, as the presence of sewer-gas in the water mains, for instance, it is a matter of my personal experience, which cannot be called in question, and the strength of the language used does not affect the facts. As to the 'animus' mentioned, it is quite a delusion. The writer was unconscious of the existence of the Ventnor Gas and Water Company until a stay at Ventnor forced its existence upon his notice, and the report is absolutely free from animus. THE WRITER OF THE REPORT.

Special Reports.

GOVERNMENT INQUIRY AT CROYDON.

IT appears from reports which have appeared in the local journals that Dr. Buchanan is prosecuting his inquiries into the causes of the late epidemic at Croydon with considerable vigour. The *Advertiser* informs us that he attended a meeting of the local board on Tuesday the 14th inst., and communicated to that body the course he should pursue in the inspection he intended to make into the causes of the recent epidemic of typhoid fever. The inspector alluded to the reports of the medical officer of health as containing evidence 'that the water-mains were in a condition which, under certain circumstances, might produce fever. At the same time he did not prejudge the question when he stated that the condition mentioned was a condition of risk which, apart from the production of fever, ought not to exist in Croydon.'

On the following day Dr. Buchanan held a meeting at the Town Hall, to which he had invited those who had memorialised the Local Government Board. He asked them to communicate to him any line of inquiry which they considered likely to be useful to him in arriving at the truth in the matter upon which he had been sent down. The local board had determined that every assistance should be afforded to him in solving the problem which had been submitted to him, and he wished the memorialists to tell him any points which they considered likely to throw light upon the causation of the disease. Dr. Buchanan declined to allow the memorialists to go into the question in the ordinary manner of a Government inquiry; he stated that his duty was to inspect and to look for himself; he asked them, therefore, to tell him in what directions he was to look and what for. He had communicated his wishes to the memorialists that they should appoint a spokesman who should direct him on the line upon which he wished to get evidence. Mr. Ellborough said he appeared on behalf of the memorialists, and submitted a series of suggestions, the larger number of which Dr. Buchanan would be certain to follow, without being instigated thereto by the memorialists, nevertheless he submitted them. First and foremost there was Dr. Carpenter's opinion, that the water-supply was contaminated by certain arrangements which continued in operation at the water-works, but he had to suggest that cases of fever had arisen among those who did not take the Croydon water. Then again, an overflow-pipe had been stated to have been discovered communicating directly with the sewer which conveyed the overflow from the reservoir. Then, again, it had been said that surface-drainage had been diverted from the sewers, whereby they had been deprived of their proper flushing; another theory was that it had been produced by the escape of sewer-gas into the houses of the inhabitants. Again it was said that the wells themselves were liable to be polluted by surface-water; and he submitted some analyses made by Professor Wanklyn at the instigation of the local board, which appeared to corroborate that idea (Dr. Carpenter had explained this at the preceding meeting of the board as not proving any serious contamination). Mr. Ellborough also suggested that the mains recently laid down were defective, that the sewers were defective, and many other matters, many of which were antagonistic to each other. Many irrelevant suggestions were made by different persons present, and eventually Dr. Buchanan thanked those who had proffered their advice, and asked them if they had anything further to communicate to send it to him in writing.

We understand that Dr. Buchanan has been busily at work during the past ten days, and that he again met the memorialists last Wednesday, when a number of suggestions were made again to him, each person wishing to bring in some pet theory, or to ventilate some improbable cause, which ultimately led the inspector to point out how impossible it would be in a public meeting, where everybody supposed he knew better than anybody else all about it, to arrive at the solution of a most intricate scientific question which could only be determined by personal investigation on the spot. He told the meeting how

he had been occupied, and that he was still open to receive suggestions, but he could not listen to speeches which were not so much intended for him as for the inhabitants of Croydon. He again asked for written communications which might direct his investigations.

Mr. Ellborough again appeared on behalf of the memorialists, but nothing of importance was submitted for the inspector's consideration.

SOCIETY OF MEDICAL OFFICERS OF HEALTH.

THE usual monthly meeting of the medical officers of health took place on Saturday, the 18th inst. Dr. Buchanan, the president, in the chair, when Dr. Taafe, medical officer of health for Brighton, was elected as an extra metropolitan member, and Mr. Lovett as a metropolitan member.

After the usual formal business had been disposed of, Dr. T. O. Dudfield, medical officer of health for Kensington, read two papers, one on the slaughter-houses of the metropolis, with suggestions for their improvement; and another on London dairies and cow-houses.

In the first paper Dr. Dudfield traversed the ground which has been gone over before in our columns very fully, and his suggestions for the proposed improvements were referred to the committee of the society for full consideration.

In the discussion which ensued, Dr. Buchanan said that there could be no doubt that all medical officers of health would agree with Dr. Dudfield, but the question was as to how far their powers extended in the matter. Dr. Stevenson said that in St. Giles's parish, where two butchers had been fined for an infringement of the Slaughter-house Act, the effect was found to be beneficial. The law was however, in an uncertain state, and it was necessary that medical officers should combine together in a definite course of action. He strongly urged the removal of the underground wells, which are a source of great evil when the water is used as it frequently is.

Dr. Tripe thought that medical officers should strongly oppose all applications for the renewal of licenses in cases where any infringement of the Act had been discovered.

In the paper on the Regulations of Dairies, Dr. Dudfield traced clearly the dangers which arose from an unhealthy condition of the cow-sheds, an injurious and unsuitable diet for cows, the want of cleanliness, and the danger of milk as a carrier of contagion derived from *employés* in and about the dairies. Dr. Dudfield instanced the researches of Dr. Buchanan, Mr. A. H. Smee, and Dr. John Tidy, as confirming his views as to the urgent necessity of adopting some stringent rules for the better regulation of the London dairies, since dangers from that source surround us on all sides. The effect of milk from a cow suffering from foot-and-mouth disease was in some instances likely to cause inflammation and ulceration of the mouth to those who partook of it, whilst young pigs frequently die from partaking of milk from cows suffering from that disease.

Dr. J. M. Tidy said that in his district he had succeeded in abolishing absolutely all underground water wells, which were a fruitful cause of sickness in cowsheds. As a source of disease it is important to note how easily poisons may be administered through milk. As an instance he stated a case in which three pups were poisoned by strychine, imbibed through the mother's milk, although the mother lived. As milk is such an easy means of propagating disease, it is highly necessary that stringent regulations should be made and enforced in regard to it. After some further discussion it was decided that Dr. Dudfield's suggestions in respect to the dairy regulations should also be referred to the council of the society for consideration, etc.

Mr. Rendle, late medical officer of health for St. George's, Southwark, read a paper on the supply of water to the public. This paper was, however, a reproduction of one which was read at the recent meeting of the Social Science Association at Brighton.

Medical Officers' Reports.

SCARBOROUGH.

J. W. TAYLOR, M.D.

IN his Annual Report for the year ending December 31, 1874, Dr. Taylor congratulates the Town Council on the increasing salubrity of their borough. In 1872 the births were 835 to 523 deaths; in 1873, 779 to 500; and in 1874, 795 to 472.

Mr. Shaw, of the Postal Telegraph Service, has furnished Dr. Taylor with some valuable meteorological observations, and from these it appears that the Queen of Northern Watering Places has, especially in the winter months, a very moderate daily range of temperature. The winter months also are warmer and the summer months cooler, than is the case in the British islands generally.

The death-rate in 1874, after deducting eighteen deaths amongst visitors, was at the rate of seventeen per 1,000 per annum. The average death-rate for the ten preceeding years was twenty-four per 1,000; in 1872 it was twenty per 1,000; and in 1873, 18·1 per 1,000. The number of total deaths in each quarter was 111 for the first quarter, 102 for the second, 125 for the third, and 134 for the last.

Of children under one year, twenty-two died in the first quarter, seventeen in the second, forty-three in the third, and forty-three in the fourth. Between one and seven the numbers were eleven, thirteen, thirteen, and eleven respectively; so it appears that the healthiest quarter for adults was the most fatal one for infants, but that between one and seven the distinction became less marked.

These figures appear also to demonstrate that atmospheric influences were most favourable to infant life in the spring quarter of the year, at least at Scarborough.

SKIPTON AND SETTLE.

DR. WEST SYMES'S first report on the sanitary condition of the combined districts in the Skipton and Settle Unions (Skipton, 1875) shows how much there is to be done to restore the valleys of the Ribble, the Aire, and the Wharfe to the healthy condition in which they were found by their inhabitants, and to rescue them from their present contamination. In many villages in both the Settle and Skipton Unions there is a total absence of all sewers, the slopwater and other liquid refuse from the houses either being collected in cesspits, or passing along open ditches, or in stone drains—drains which were originally intended solely for rain water—and in which, owing to the irregularities in their sides and bottoms, collections of offensive matter are sure to lodge and stagnate; percolation and con-

sequent impregnation and saturation of the soil being also permitted in them besides atmospheric pollution.

Dr. West Symes details some judicious proceedings on a small scale by himself and his inspectors to abolish individual nuisances. But 'the authorities' do not seem to move actively in larger matters. At page 20 it is noted that at Barnoldswick a committee was appointed, April 30, 1874, to carry out a system of drainage for the main part of the town, but no works have been commenced up to this date. A good deal of small-pox was from time to time imported into Skipton from the notorious Keighley Union, 'when the severe epidemic of small-pox existed at the time, the severity of which was much increased by the anti-vaccinating policy of the guardians.' By attention to vaccination, however, and proper measures of sanitation, the disease was quickly limited. Dr. Symes's suggestions for a public abattoir seem to us most judicious; he has published an excellent first report, and we trust to hear from time to time of the progress of sanitation in his district.

Law Reports.

MILK ADULTERATION.

EDWARD BEDDEL, of 1, Park Street, Borough Market, was summoned by Mr. Errington, the inspector of St. Saviour's Board of Works, under the Food and Drugs Act, for selling as pure milk a mixture adulterated with 10 per cent. of water, and devoid of cream. Mr Simpson, vestry clerk, prosecuted. The defendant said he had his milk of Mr. Kerly, a wholesale dealer, and found it genuine by the lactometer. Mr. Benson fined the defendant 5*s.* and 12*s.* 6*d.* costs.

POLLUTION OF WATER BY SEWAGE.

V.C. SIR J. BACON has had before him the case of *Wood* v. *The Harrowgate Commissioners*. This was a motion in a sewage case to enforce compliance with an injunction by a sequestration order. The commissioners had diverted the sewage so as not to fall immediately into the beck, to prevent the fouling of which the suit was commenced; but they poured the sewage upon land acquired for the purpose, and the plaintiff now complained that there was no improvement, for the sewage still found its way into the beck. The Vice-Chancellor considered that the commissioners had neglected to take proper steps, and he made some strong remarks upon their neglect. He ordered that a writ of sequestration should issue, which should not be put in force for three months, to give time for works.

The same Vice-Chancellor has dealt with the case of *The A.-G.* v. *The Corporation of Newcastle-under-Lyne*. This was a similar application. The injunction, however, was granted as long ago as 1861, and the corporation have adopted the process of defecation by subsidence-tanks. The Vice-Chancellor was here also of opinion that the Corporation had been negligent, and ordered the issue of a writ, with a similar term of three months' grace.

RECREATION GROUNDS.

IN the case of *The A.-G.* v. *The Corporation of Sunderland*, the object of the information was to restrain the corporation from erecting public buildings on part of some land abutting on the Sunderland Park, which they have recently obtained for the purpose of enlarging the park. The existing park was about fifteen acres in area, the land newly acquired was in separate pieces of ten acres in extent. On a small portion of this, not yet laid out, the corporation proposed to erect a town hall and corporation buildings, a public library, school of arts, and museum. Mr. Jackson, Q.C., for the defendants, argued that the land was vested in them, with a discretionary power to use it for public purposes, and that even if any trust was impressed upon it it was within the term of the trust to use it for the objects in question, the erection of which, it was said, would be an improvement and protection to the park. The Vice-Chancellor, however, was of opinion that the erection of any of the proposed buildings, except a museum and conservatory, was beyond the power of the corporation, even the library and school of arts, and granted an injunction.

POWERS OF GAS COMPANIES.

E. BUCKLAND, of No. 158, Bridge Road, Battersea, was summoned, on behalf of the London Gas Company, to show cause why he should not be committed to prison, in default of paying the sum of 9*l.* or. 9*d.* ordered to be paid under a summons at this court for gas consumed at 323, Fulham Road. Mr. Arnold had expressed his intention not to make orders of commitment against persons who had not means of payment, thereby acting with the discretion vested in county and superior court judges, and especially referred to the new Master and Servants Act, which prescribed the same form of procedure in police-courts as that used in county courts for the recovery of these debts.—The defendant said he was a commission agent, and earned barely a pound a week.—Mr. Dove, for the company, urged that the powers vested in a county court judge did not appertain to gas companies in police-courts. They had an Act of Parliament which enacted that in default of distress the magistrate should (not might) commit, and therefore he had no alternative; and with regard to the *quasi* county court jurisdiction, the abolition of the Imprisonment for Debt Act, 1869, exempted orders made by magistrates, and the Companies Clauses Consolidation Act, 1845, sec. 149, prescribed the form of procedure and commitment for three months in default of payment or distress.—Mr. Arnold was satisfied that the defendant could not pay, but at the same time clause 49 of the Act of 1845 rendered a commitment imperative. He therefore ordered the defendant to be imprisoned for one day.—Defendant was locked up till five o'clock.

PROSECUTION FOR THE ILLEGAL SALE OF SHEEP-DIPPING COMPOSITION.

A CASE of some considerable interest to country members of the trade has just been tried at the Ludlow county court, in which Thomas Teague, a beer-house keeper, was sued by the Pharmaceutical Society of Great Britain for a penalty of five pounds incurred under the Pharmacy Act, 1868, by the illegal sale of poison. From the evidence brought forward it appeared that the defendant was not on the Register of Chemists and Druggists, and it was admitted that the sale complained of had been made by the defendant's daughter at his beer-shop. The article sold consisted of packets of a compound of arsenic and sulphur, each packet containing sufficient arsenic to poison over a hundred persons. It was also proved that the sale had been to a tailor who was a stranger at the place; and, on asking for packets of sheep-dipping composition, was supplied with them without any precaution whatever.—In reply to the charge the defendant asserted that he sold the packets as they had been supplied to him, and bearing labels describing them as sheep-dipping composition; also that he had sold them in this way as an agent for the sale of sheep-dipping composition.—After a long hearing of the case, the judge decided that the sale was contrary to the Act of Parliament; and, accordingly, judgment was given for the penalty sued for, with costs against the defendant. In this case there was not even the semblance of a reason for the excuse, often made in similar instances, that the arsenical composition was really sold for agricultural purposes, and according to the evidence it was shown that no effort was made to ascertain the purpose for which it was required. Independently, therefore, of the fact that the seller was not entitled to sell poison in virtue of being on the Register of

Chemists and Druggists, it is evident that the sale of such preparations in this manner affords very dangerous facilities for obtaining poisons for improper purposes. Not long ago the sale of vermin-killers under similar conditions, by oilmen, grocers, and others, was found to give rise to a very large number of cases of poisoning, either by accident or with intent; and it was on this account deemed necessary not only to enforce the provisions of the Pharmacy Act as regards those illegal sales, but also to give additional stringency to the regulations for the sale of vermin-killers by registered chemists and druggists. To judge from the facts of the case above mentioned, and others that have not as yet been brought into court, they would seem to indicate the necessity of similar measures in connection with the sale of arsenical sheep-dipping composition.

PAVING POWERS OF LOCAL BOARDS.

THE Master of the Rolls has had before him the case of *Bagshaw* v. *The Buxton Local Board*. The question was, whether a slip of garden in front of 7, Terrace Road, Buxton, was an encroachment on the highway. The history of the litigation is singular. The plaintiff Potter is owner of No. 7, and tenant of No. 8. In August, 1873, Potter paved the slip of garden in front of No. 8, which is used as a shop, and erected a verandah of iron and glass at a cost of 150*l*. As soon as this was completed the Local Board demolished it as an obstruction. Potter brought an action of trespass against the board at the Derby assizes in 1874, and obtained a verdict with 160*l*. damages, on the ground that in the opinion of the jury the Local Board were not entitled to the land, and there was no evidence of dedication. Before the trial, and in consequence, as the plaintiffs suggested, of being served with the writ in Potter's action, the local board served a notice on Bagshaw, the occupier of No. 7, requiring him forthwith to lay the strip of garden in front of his house into the highway, upon which Bagshaw and Potter instituted this suit for an injunction, which was concluded with the singular but not unexpected result of establishing the right of the Local Board, which, after the finding of the jury in the case of the adjoining house, had been disputed with great confidence.—The Master of the Rolls said there never was a case more clearly proved than that of the defendants. The only thing the plaintiffs had to go upon was the success of the action against the board. At the trial of the action the garden in front of No. 8 was assumed to be the property of the Duke of Devonshire, and, therefore, not part of the highway, but it now appeared, on reference to the map annexed to the award of 1774 and other maps and plans, that the garden in front of No. 7 was never the Duke of Devonshire's land, but originally formed part of the ancient highway. Besides, the conveyance of the site of No. 8 was now in evidence, and it contained a covenant on the part of Potter's predecessor in title to construct and maintain a footpath ten feet wide in front of No. 8, on the site of the present garden. It appeared that the Duke of Devonshire's agent many years ago gave the plaintiffs' predecessor leave to enclose the garden, there being ample space left for a footway in front of it, and that their predecessor enclosed it accordingly, which, as the soil was not the Duke's, he had not a pretence of title for doing. The Local Board did not object at the time, nor for years afterwards, but they chose to do so at last, and no lapse of time could bar the public right as to what the evidence clearly showed to have been once part of the highway. Something had been said of the unfairness of the Local Board dealing thus with the plaintiffs, while taking powers to buy up the rights of other owners of gardens in Terrace Road; but the fact of the Local Board having for some reason or other acted as they had in this particular instance could not affect the result of the suit, which must be dismissed, with costs; for the plaintiffs, having acquired their property with notice that the garden was an encroachment, could not complain if the public at last asserted their rights.

THE MEANING OF THE WORD 'MEAT.'

CONCERNING the meaning of the word 'Meat,' Mr. S. G. Johnson, town clerk of Nottingham, has sent to the *Times* the following ingenious criticism of Mr. Headlam's decision against butter-eaters:—'Is Mr. Headlam, the stipendiary at Manchester, justified in holding that butter is not meat within the meaning of section 116 of the Public Health Act, 1875? This section imposes a penalty on any animal, carcass, meat, poultry, game, flesh, fish, fruit, vegetables, corn, bread, flour, or milk exposed for sale, etc., and intended for the food of man, which is found to be unsound or unfit for the food of man. The defendant was summoned for selling meat—to wit, thirteen tubs of butter—intended for the food of man and unfit for that purpose. Meat is defined in Webster's Dictionary to be 'food in general; anything eaten for nourishment, either by man or beast;' and instances are given from the Old Testament Scriptures to prove that this is the true meaning of the word. If meat is to be confined to "animal muscle," then why is the word "flesh" introduced into the section? It is true that the canons of interpretation require that penal Statutes should be strictly construed, and that the intention of the legislature must not be conveyed by "cloudy and dark" words only: but surely in this instance the terms are reasonably plain and explicit. Mr. Headlam's interpretation certainly violates another canon of interpretation—that words must not be interpreted in a meaning so restricted as to withdraw from the operation of the Statute a case which falls both within its scope and the fair sense of its language; and also another canon—that no construction is admissable which would sanction an evasion of an Act of Parliament (See Maxwell on the "Interpretation of Statutes," page 238). Until the question has been decided by the Queen's Bench I cannot accede to the proposition laid down by Mr. Headlam—that, as the law now stands, there is no power to prevent any one from selling bad butter.'

There is, no doubt, much force in the above observations, and if the question had to be settled by an appeal to the dictionary only, Mr. Johnson's views must prevail; but it is a question whether the usage of two or three centuries having given a restricted use to the word 'meat' the Courts would not feel bound to make their decision harmonise with the modern usage in the matter.

NOXIOUS GASES FROM CHEMICAL WORKS.

V. C. HALL has had before him the case of the *Attorney-General* v. *the Hyde Chemical Company*. This was an information filed at the instance of the Local Board of Hyde, Cheshire, to restrain the defendants from carrying on their manufactory in such a manner as to be a nuisance by the discharge of noxious gases, fumes, or vapours, the emanation of smells, the discharge of smoke, and the escape of refuse into the River Tame within the Hyde district, or by other consequences of the accumulation and escape of noxious and offensive products. The business of the defendants is that of tar and resin distillers, manufacturing chemists, and oil merchants, also that of makers and sellers of sulphate of ammonia, benzol, naphtha, varnishes, resin, oils, waggon-grease, and product of the distillation of gas tar, and other substances. The present proceedings were instituted in consequence of complaints made by the inhabitants of Hyde, of annoyance experienced from the noxious fumes and vapours alleged to be emitted from the defendants' works in their manufacturing processes, and from the refuse liquid discharged from the works into the river. After referring to the evidence of the scientific and other witnesses on behalf of the defendants, that the smells from the works did not constitute a public nuisance, and were not injurous to health, among which was an affidavit deposing that the medical men in the neighbourhood had within the last month sent about forty children suffering from whooping cough to the manufactory to inhale the fumes of pitch, contended that the manufacture of the defendants was a new one, and that, although when they first began

their machinery was not so perfect as at present, progressive improvements had been continually made, and the business had been carried on without doing harm to any one. They insisted that there was not now and had not been anything which amounted to public nuisance. The Vice-Chancellor said the case seemed to be a very plain one, and the ques- which he had to try was whether or not the informant had established that at or about the time the information was filed, the defendants were carrying on their business so as to be a public nuisance. There had been the evidence of many witnesses, who had explained the different processes carried on at the works. It was not material to criticise the discrepancies between the evidence, for although, if the questions were treated as scientific ones, then the balance of scientific evidence might be in favour of the defendants, as showing that a nuisance ought not to exist, what his lordship was bound to do was to try the question as a matter of fact by the evidence of persons who had had the opportunity of judging by their own actual sensations; and against the evidence of such persons it was not sufficient to bring forward other persons who said that such sensations and feelings were not produced in them. There was a great diversity in people's occupations, and some persons might be found who lived to an advanced period of life, apparently in robust health, even though engaged all their lives in noxious pursuits. These persons were, no doubt, the exception, but they were always available when evidence was wanted. It had been sought to attribute the nuisance complained of to other manufactories, but upon the evidence those other manufactories were not chargeable with the offence, and the smells from them were of a different character. The particular noxious smell from the defendants' works was that of sulphuretted hydrogen gas—a smell that could not be mistaken for all the other smells put together. A number of witnesses had all suffered inconvenience from this particular smell; it had been traced to the works, and the evidence was brought down to the time of the information. Therefore his lordship could not hesitate for a moment in finding a verdict for the plaintiff, and he should accordingly grant an injunction, according to the prayer of the bill, to restrain the defendants from carrying on at their manufactory any of the processes then carried on by them in such a manner as to be a nuisance, and they must pay the costs.

BY-LAWS AS TO BUILDINGS OF RAILWAY COMPANIES.

THE Great Northern Railway Company have been summoned for a breach of the by-laws of the Bashford Local Board, by erecting dwelling-houses without first depositing plans.

The surveyor to the Local Board said that the Great Northern Railway Company had erected houses within the district of the local board without first submitting plans to the board, and the houses were not built in accordance with the by-laws of the board. They were dwelling-houses and not necessary for the traffic of the railway, although close to the line. Mr. Spencer quoted the by-law bearing on the case, in which it was provided that detailed plans, sections, etc., of buildings should be deposited with the board, and notice given.—Mr. Leach said that there were two points he had to bring forward for the defence, the first being that by the Railway Acts the company were in no wise subject to by-laws under the Local Government Act. He also contended that under the by-laws the board had no power to enforce the depositing of the plans, because by the eleventh section, under the head of exempted buildings, were included 'buildings belonging to any canal, dock, or railway company, and used for the purposes of such canal, dock, or railway company, under the provision of any Act of Parliament.' He would prove by Mr. Stubbs, the engineer to the company, that the buildings in question, when completed, were actually in use for the purposes of the railway company. It was for the company to judge whether or not the buildings were necessary. By the company's special act they were authorised to make the railway in question, subject to the provisions of certain other railway acts. The Railway Clauses Consolidation Act, 1845, provided that it was lawful for a railway company to construct as accommodation works connected with the railway 'such houses, warehouses, offices, and other buildings, yards, stations, warehouses, engines, machinery, apparatus, works, and other conveniences,' as they may think proper, subject to this Act of Parliament, and the Special Act, and no other, provided always, that in the exercise of the powers of this Act and the Special Act they shall do as little damage as can be, and make full satisfaction to all parties interested for all damage by them sustained by reason of the exercise of such powers. Thus the defence consisted of two points. First, that the company were exempted under the exemption clause of the board's by-laws, and if not, by the fifteenth section of the Railway Consolidation Act of 1845. The buildings were not temporary erections, but permanent ones, for the purposes of workmen who were compelled to be constantly on the spot. Mr. Stubbs, called for the defence, said he was engineer to the company, and engaged in the erection of these cottages. The cottages were intended as residences for the platelayers, who had to maintain the line and keep it in good order. The houses were, in his judgment, absolutely necessary for the purposes of the railway. On a question whether the witness had known of a case in which a local board had interfered previously, Mr. Spencer objected to the question, saying that if the houses had been erected in accordance with the by-laws of the board nothing would have been said; but they were erected in such a dangerous manner that they had been compelled to interfere. Mr. Spencer argued that the houses were not necessary for the working of the line in accordance with the meaning of the Act of Parliament. His contention was that the word 'houses' meant houses in connection with the buildings of the line. The magistrates dismissed the case, Mr. Millward saying that the Bench considered that the Company were exempt under the by-laws of the board, as well as under the Act of Parliament. The Bench offered to grant a case for a superior court.

WATER-SUPPLY.

SIR,—As you have heretofore noticed some of the amendments of the Public Health Act, 1875, I beg to call your attention to the fact that prior to the passing of that Act an urban authority could, in a district supplied with water by a company under Parliamentary powers, construct any number of new cisterns, pumps, conduits, and other waterworks for the gratuitous use of any persons who choose to carry the same away, not for sale, but for their own private use, *vide* section 121 of 10 and 11 Vict., c. 34, incorporated by section 45 of the Local Government Act, 1858.—I now refer you to section 64 of the Act of 1875, which authorises the local authority, subject to the provisions of that Act, to construct similar works, but as such works are to be subject to its provisions, may I ask whether, in your opinion, it is necessary, before erecting a pump for the gratuitous supply of water to the inhabitants to give the notice to the water company, as mentioned in section 52, and if the company are able and willing to supply water, proper and sufficient for the purposes required, are the local authority justified in erecting the pump? *Vide* 'Waterworks,' interpretation section.

There is another point to which I wish to advert, namely, in a district which a water company has power to supply under an Act, but which it supplies only to the extent of one-half, its area declining to supply the other half on account of its non-remunerative character, may the local authority give written notice to the water company, that they are desirous of supplying water for the purposes and to the extent therein specified, and if the company decline, or are unable or unwilling to supply the water required, can the local authority proceed to establish waterworks irrespective of the company?' AN URBAN CLERK.

[It is not very clear what would be the precise effect of the restrictive words in section 64 of the 'Public Health Act, 1875.' We are half inclined, however, to doubt whether they would be held, as our correspondent suggests, to prevent the erection of such limited works of water-supply as public pumps. The non-competition provisions of the Act are, we consider, applicable only to wholesale supplies of water. No doubt the interpretation clause militates against this idea, and it is scarcely safe to speak too confidently. With reference to the second question, our answer must certainly be in the affirmative; section 52 seems intended to meet exactly the case submitted by our correspondent. The water company is empowered to serve the whole of the district; it declines, however, to do so on the ground that it would not pay to do so. Clearly, then, this is *not* a company 'able and willing to supply water.' Of course, before attempting to take the matter into its own hands, the local authority must give to the water company the notices prescribed by the section.]

Correspondence.

SANITARY REMARKS ON TRAPS AND SOIL-PIPES.

(*To the Editor of the* SANITARY RECORD.)

SIR,—It may, perhaps, interest your readers to know that the results of the experiments as to the passage of sewer gas through water traps, which Dr. Fergus refers to in his admirable paper last week, are fully borne out by practical experience. I will, therefore, give a brief account of two instances of this which have recently come under my own personal observation.

The first case was that of a fixed washhand basin, where a very disagreeable smell was noticed. On examination this was found to proceed from a current of foul air which came up the outlet of the wash basin, or on this being closed, through the overflow holes at the side of the basin. Further investigation showed that the wash basin was connected with a trapped gully outside the house which discharged into a cesspool. The gully was covered with a stone, and on removing this the trap was found to be in perfect order, but the water in it, though quite clean, had a very foul smell. Suspecting contamination by sewer gas I had a pail of water poured down the gully so as to change its contents. The smell was thereby removed, but on examining the gully after a few hours the water was found to have become quite foul again from the absorption of sewer gas passing through the trap.

The second case was that of a small gully or sink for receiving the drippings from a water-tap in a kitchen in a first-class London house. This gully was properly trapped and then connected directly with the house drain, which, after passing a second water trap, connected with the public sewer. The smell from the water in the gully was very offensive, but as in the previous case, after fresh water was poured down the smell was completely removed. On examining the gully, however, about an hour and a-half afterwards, the water in it was found to have again become foul from the absorption of sewer gas passing through the trap.

I can also confirm what Dr. Fergus says as to the retention of foul matter in ordinary traps, and the consequent decomposition which goes on. This retention takes place not only in the traps in the drains outside the house, but in the traps inside the house, and particularly in ordinary water-closets and so-called 'D traps.' I have been so much struck by this, that I have lately specially investigated the subject by having various lead traps cut open to examine their internal condition, and have found excremental matter where quite unsuspected.

While, however, agreeing with Dr. Fergus in his facts, I feel bound to say that I cannot agree with him in his conclusions. He appears to assume that the defects alluded to are inherent in the water-carriage system, and that the only true sanitary solution is to discard this, and to adopt some other system, such as the dry-earth method. Now, though I quite agree that earth-closets are excellent appliances, if properly managed, I am equally certain that if they are improperly managed, they will be as great a nuisance as faulty water-closets. The true and only remedy for the defects pointed out by Dr. Fergus is to remove their cause—viz. improper construction. Carry out the house-drainage on proper principles, disconnect the drains properly from the sewers, and the waste-pipes from the drains, ventilate the drains properly by introducing a current of pure air, discard unnecessary traps, and, when they must be used, employ simple ones of proper construction, which will not retain foul matter but flush themselves clean, and the water-carriage system can be made as perfect as the strictest sanitarian can desire.

ROGERS FIELD.

5, Cannon Row, Westminster, S.W.,
December 20, 1875.

APPOINTMENTS OF HEALTH OFFICERS, INSPECTORS OF NUISANCES, ETC.

AIRD, Mr. John A., has been appointed Surveyor and Inspector of Nuisances for the Northwich Urban Sanitary District.

CHICK, Mr. William, has been appointed Inspector of Nuisances for Dorchester, vice Phillips, resigned.

CORBETT, Mr. James Andrew, has been appointed Clerk to the Penarth Urban Sanitary Authority, Glamorganshire.

DAWSON, Mr. John, has been appointed Surveyor to the Corporation and Urban Sanitary Authority of Stockport.

DAWSON, Mr. Tom, has been appointed Surveyor and Inspector of Nuisances for the Benwell and Fenham Sub-District of the Newcastle-on-Tyne Rural Sanitary District, vice Douglass, whose appointment has expired: 120*l.* per annum.

DEVANY, Patrick Charles, L.R.C.P. Edinburgh, L.R.C.S. Ireland, L.A.H. Dublin, has been appointed Certifying Factory Surgeon for Sligo, vice Tucker, deceased.

EMINSON, Robert, M.R.C.S. England, L.S.A. London, has been re-appointed Medical Officer of Health for the Gainsborough Rural Sanitary District: 125*l.* for one year.

FORREST, Robert, Esq., has been appointed Chairman of the Penarth Urban Sanitary Authority.

LEE, Mr. Thomas, has been appointed Inspector of Nuisances for the Penistone Rural Sanitary District and the Clayton West, and Gunthwaite and Ingbirchworth Urban Sanitary Districts.

MACKINTOSH, Angus, M.D. Glasgow, L.F.P.S. Glasgow, and L.M., has been re-appointed Medical Officer of Health for the Whittington Urban Sanitary District for twelve months from April 15 next.

NORMAN, Mr. William, has been appointed Surveyor to the Corporation and Urban Sanitary Authority of Dorchester, vice Phillips, resigned.

TAYLOR, Mr. Jasper, has been re-elected Inspector of Nuisances, for three years to the Witney Rural Sanitary Authority, and his salary raised from 160*l.* to 200*l.* per annum.

TURNBULL, Edward, Esq., has been appointed Chairman of the West Hartlepool Improvement Commissioners and Urban Sanitary Authority, vice Emerson, whose appointment has expired.

VACANCIES.

BRYNMAWR. Certifying Factory Surgeon.

HESTON AND ISLEWORTH URBAN SANITARY DISTRICT. Surveyor: 150*l.* per annum. Application, 27th instant, to Hickson Briggs, Clerk to the Authority, Isleworth.

MAIDSTONE URBAN SANITARY DISTRICT. Collector.

SWINTON URBAN SANITARY DISTRICT, Yorkshire. Surveyor and Inspector of Nuisances: 120*l.* per annum. Application, 28th instant, to Frederick L. Harrop, Clerk to the Authority.

PENARTH URBAN SANITARY DISTRICT, Glamorganshire. Medical Officer of Health, Treasurer, Surveyor, Inspector of Nuisances, Collector.

TRURO URBAN SANITARY DISTRICT. Medical Officer of Health.

SANITARY PATENTS.

3722. Improved apparatus for the prevention of smoky chimneys, applicable also for ventilating purposes. Joseph Hookey Tarrant, Weymouth Street, New Kent Road, Surrey.

3732. Improvements in apparatus for supplying heated air in buildings with economy and efficiency. Thomas Waller, Fish Street Hill, London.

3754. A new or an improved mode of arranging seats in sea-going vessels to prevent sea-sickness. William Lloyd Wise, Chandos Chambers, Adelphi, London. A communication from Alfred Belvallette, Paris.

3758. Improvements in lamps. William John Pinkerman, Strand, London. A communication from Louis Allen Presby, New York, U.S.

3768. Improved machinery for manufacturing bricks, tiles, and pipes. Charles Henry Murray, Loman Street, Southwark.

3804. A medical preparation or preparations applicable to the treatment of what is known as foot-and-mouth disease in cattle, being a specific therefor. John Finney, Winlaton, Durham.

3826. Improvements in the manufacture of gas for illuminating and heating, and in apparatus employed in the said manufacture. Samuel Cornforth, Frederick Ratcliff, and William Henry Ratcliff, Birmingham.

3838. Improvements in apparatus used in the manufacture and distribution of gas. William, White, Abersychan, Pontypool, Monmouthshire.

3938. Improvements in the manufacture of dietetic foods. Campbell Morfit, Southampton Buildings, London.

ABSTRACTS OF SPECIFICATIONS.

1644. Floating garments. P. Boyton, New York.

The invention consists in means of securing a watertight joint between the tunic and pantaloons, and also of relieving the head of the wearer from the close pressure and confinement of the headpiece and facilitating the sense of hearing. The invention also consists in combining screw or paddle propelling apparatus with an air-inflated garment of this kind.

1652. Inhaling apparatus. J. R. Harper, Clerkenwell.

This invention relates to improvements in apparatus of the character described in the provisional specification for which letters patent were applied for by Robert James Lee, dated November 5, 1872, no. 3277, for improvements in inhaling apparatus, applicable also for heating medical baths. One feature of the improvements consists in combining the safety valve with a spun or stamped metal cover of considerable size, a quick threaded screw being formed thereon, by which means the cover can be readily removed or replaced when required, or the cover may be secured by projections and slots, or fixed like an ordinary man-hole plate or otherwise if desired. According to another part of these improvements the interior jet pipe is fixed or soldered to a transverse pipe fixed in the air pipe so as to render the jet readily accessible for cleaning or otherwise. Another of these improvements consists in forming the external jet or conducting pipe with a universal joint. Another feature of these improvements consists in the improved method of arranging the handle of apparatus of this character by combining it with wood or other non-conducting material. Apparatus of this character may be employed for generating medicated and other vapours for inhaling purposes, for medicated and vapour baths, or for disinfecting and ventilating purposes, by exhausting or discharging air from rooms, ships' holds, or other places.

1655. Apparatus for containing compressed gases. R. M. Cafall, Fleet Street.

Liquefied carbonic acid gas is placed in a vessel fitted with a nozzle with one or more taps. In the case of a fire the taps are turned and the vessels thrown into the room, when the escaping gas extinguishes the fire.

1662. Water-closets. P. Buchan, Glasgow.

The essential improvement of this invention consists in coating the outside of the copper or brass pans of water-closets (as they have been hitherto coated on the inside only) with tin, lead, or a mixture of these metals, or galvanised with zinc, which coating of these pans will make them last twice the time they have done hitherto.

1674. Safety lamps. M. I. Landau, Goulston Square.

Air is admitted through the air chamber or through passages in the chamber or oil well, after passing through spaces left between plates or supplementary bottoms. Like arrangements are used for the escape of the gaseous products of combustion. Air orifices are formed in the chimney. A ring cap or ferule opens and closes the orifices and air spaces. The air enters transversely to and through the current to be acted upon. An arrangement for extinguishing the flame of wicks by acting on the end opposite to the combustion end is described, and this may be applied to extinguishing plates for gas flames.

1680. Artificial fuel. J. Deere, Brighton.

The fuel is composed of coal, lime, clay, gypsum, or copperas, mixed with a gelatinous solution.

1693. Cover for water-closets. M. A. Popoff, Priajka, St. Petersburgh.

The invention consists in the use of a ventilating lid or cover placed over the orifice through which the gases or emanations would escape, such cover consisting of a cylinder with a top and bottom of wire network or grating. The space in the cylinder between the said top and bottom is filled with charcoal, and the gases before escaping must pass through the cylinder containing the charcoal, whereby they are disinfected and deodorised. The rim of the cylinder is adapted to shut down into a groove surrounding the orifice in the seat, such groove being partially filled with fine sand, whereby the escape of gases between the lid or cover and the seat is prevented.

1694. Purification of gas. J. Whitley, Roundhay.

This invention describes a means of purifying gas by filtering it through layers of cotton-wool or other fibrous material.

1701. Utilising inflammable fluids for illuminating and heating purposes. H. Browne, Gray's Inn.

This invention has for its objects the improvement of the means of employing inflammable fluids such as petroleum, naphtha, and the like, for illuminating and heating purposes, and also the rendering the employment for such purposes of such inflammable fluids less dangerous, and consists of an arrangement of reservoirs, pipes, and cocks for supplying the fluid to the lamps or other apparatus automatically.

1725. Peat fuel. W. R. Lake, Southampton Buildings.

This invention has for its object the manufacture and refining of peat for fuel. For this purpose the crude bog peat is first subjected to a peculiar grinding and kneading process, by which it is mixed with water and well puddled until the peat is thoroughly taken up and held in suspension in water; this mixture is then pumped up and forced through pipes to any convenient distance, where it flows into a drying ground and spreads over the same, and is held therein by suitable dams forming a shallow basin, where the valuable portions of the peat settle to the bottom in fine powder, forming a homogeneous mass, after which the water is drawn off and the residuum is allowed to dry.

1751. Sweeping chimneys. G. Black, Spittlegate.

This provisional specification describes using metal rods coiled to a spiral form; they are made in lengths and joined together when required for use. The way of using the apparatus is also described.

1752. Purifying illuminating gas. S. Hallsworth, Leeds, and R. Bailes, Woodhouse Carr.

First, iron oxidised ore, residue of iron pyrites, residue of burnt or calcined alum shale. Secondly, slacked lime and dry sawdust with liquid from iron pyrites' beds, or solution of copperas, or liquid remaining after crystallisation of copperas, or from burnt alum or shale, to which is added ground iron ore, residue of burnt iron pyrites or calcined alum, or shale or spent oxide. Thirdly, dried copperas or cooler bottoms mixed with lime and sawdust. Fourthly, slacked lime and dry sawdust mixed with the ground iron ore.

1799. Closet lids. W. Walkington, Leeds.

The said invention consists in combining with a closet lid and seat a pivoted step or foot-board and an arrangement of levers and rods for connecting the said step with the lid in such a manner, that by stepping or pressing the foot upon the step the lid will be opened, and by releasing the said step the lid will be closed. And the seat is also so connected with the aforesaid mechanism that by the weight or pressure of a person sitting thereon the lid or cover will be kept open. And the said lid or cover is fitted with a deodorising box which is to be filled with any suitable deodorising or disinfectant substance, and will discharge the same into the pan when the lid is closed.

1805. Waterproof coats. T. Marshall, Belfast.

This invention has for its object improvements in waterproof coats or garments and other articles of dress, whereby free respiration is obtained in combination with a watertight garment. For this purpose, cords or tubes of India-rubber, worsted, or other suitable material are introduced between the back, shoulders, and chest of the wearer, and the inside of the back, shoulders, and chest of a coat or garment. The cords raise the coat from the back, shoulders, and chest of the wearer, and thus afford a clear flue or channel for heated air to ascend between the cords to eyelet-holes, whence it escapes. The collar which is inserted under the base of the coat collar prevents rain from entering eyelet-holes, and thus affords perfect respiration for the body, combined with a thoroughly water-tight garment. These improvements are applicable to every description of waterproof garments, such as coats, cloaks, capes, vests, leggings, overalls, garters, or other articles of dress.

1815. Lamps. K. McLeay R. Louttit, Greenwich.

The features of novelty of this invention consist in constructing a lamp for burning benzoline or other spirit or oil with perforations near the top of the wick-holder, and having the wick-holder surrounded by an outer casing, in combination with a tube which passes in the reservoir of the lamp. For lamps with circular wick-holders a tube passes down the centre, passing through the bottom of the lamp, and another tube is fixed in this tube, which terminates in the reservoir of the lamp. By constructing lamps according to this invention the combustion is improved, and the said lamps may be used either with or without chimneys.

1845. Sewage. M. A. Anderson, Edinburgh.

This provisional specification describes drying sewage sludge by adding to it coprolite and sulphuric acid.

1899. Feeding-bottles. W. R. Lake, Southampton Buildings.

This invention relates to a feeding-bottle, which is provided with valves and marked with divisions of equal capacity. The stopper is a cork covered by a capsule. It is perforated with two holes, one serving for the passage of the suction-tube, which is provided with a valve, the other being furnished with a small tube also closed by a valve, which permits the air to enter and prevents the escape of the liquid if the feeding-bottle should be upset.

1997. Waterproofing fabrics. T. Christy, Fenchurch Street, London.

This invention relates to a process of waterproofing cloth, woollens, linens, canvas, cotton, alpaca, and silk and other fabrics, and consists in the application of certain substances by which important advantages are obtained. These improvements relate to the use of a composition formed of the substances hereinafter mentioned which is insoluble, while it can be easily incorporated with tissues or fabrics, thereby arresting the passage of water, while 'air' is allowed to pass through. The inventor employs acetate of alumina and Centraria Islandica (usually known as Iceland moss); water and acetate of alumina of a light amber colour should be employed.

1918. Fæcal Closets. C. Scott, Grovefield Down.

The use of a water-tight and air-tight chamber, vessel, or receiver, through the top of which is introduced a closely fitted tube extending nearly to the bottom thereof, and having the orifice expanded, projected, or elongated into an elliptical, ovate, or oblong form; and, if desired, a separate tube having a bell-shaped mouth, may also be introduced through the top or side thereof

OPEN CONTRACTS FOR SANITARY WORK.

The Corporation of Kingston-upon-Thames are desirous of receiving tenders for the construction of about 1,634 feet run of 12-inch pipe sewer, together with the necessary manholes, ventilating shafts, gullies, etc. The plans and specifications can be inspected at the offices of Mr. Clement Dunscombe, C.E., Church Street, in the said borough. Sealed tenders, endorsed 'Tender for Drainage Works,' to be forwarded to W. M. Wilkinson, town clerk, on or before December 31 now instant.

The Local Board of Pemberton is prepared to receive tenders for the execution of certain sewerage works, comprising the excavation for providing and laying of 27,000 yards or thereabouts of 24-inch, 15-inch, 12-inch, and 9-inch stoneware pipe sewers, with the necessary manholes, lampholes, flushing chambers, and apparatus; also the construction of storage tanks, engine house, erection of pumping machinery, and rising main. Parties desirous of tendering must send in their names and addresses to the Clerk of the Local Board at Pemberton, on or before December 22, 1875. Plans and Specifications can be inspected at the offices of the engineer, Mr. H. Williams, 27 King Street, Wigan. Sealed tenders, endorsed 'Pemberton Sewerage,' to be delivered on or before January 6, 1876.

NOTES, QUERIES, AND REPLIES.

All communications must bear the signature of the writer—not necessarily for publication.

DEVOURING LITERATURE.

THE Moravian missionary, Mr. Redslab, lately undertook a perilous tour to the northern side of the Himalayas. He alludes, in a narrative of the journey, to a very curious custom which prevails among the natives. 'I learned,' he says, 'that some of the natives, believing our books to contain more wholesome instruction than their own, are in the habit of converting the leaves into globules and prescribing and swallowing them in cases of sickness.'

A MODEL VILLAGE.

MR. RUSKIN has pitched the site of his first model village, his 'Arcadia,' in the neighbourhood of Sheffield, and already announces that the subscriptions towards its support amount to 8,000*l*. With this sum he hopes to buy land enough to build a number of cottages built upon æsthetic principles, and to establish a museum, not after the debasing pattern of those too frequently to be found in large manufacturing centres. The photographs by means of which the eye and taste of the inhabitants of Arcadia are to be trained are already chosen, and must be purchased at certain designated shops.

COLLIERY EXPLOSIONS.

MR. OWEN ROWLANDS, electrician to the late Telegraph Committee of the Board of Trade, writes: 'From many years' observations, I find that by far the majority of colliery accidents take place under a peculiar condition of the earth, which continues in the form of a wave for a period of fourteen to twenty-eight days, and that the direction of such a terrestrial disturbance is invariably from S.W. to N.E., or *vice versa*. On the 2nd instant the wave had increased greatly in magnitude in the Thames Valley, as manifested by the singular appearance of the sky, being obscured by thick yellow mist or vapour for three days. The disturbance still continues, indicating the recurrence of unsettled weather.

A NEW ELASTIC HORSE SHOE.

AT the last meeting of the London Association of Foremen Engineers and Draughtsmen, Mr. Richard Winder, of Farningham, Kent, read a paper on a new Patent Elastic Horse Shoe. The invention consists in rendering the shoe elastic by the introduction of india-rubber between the two plates of iron that form the shoe, differing from other attempts at elasticity between the hoof and the shoe. Other advantages claimed for this shoe are the facility for roughing horses during frosty weather; the fact that the nails are not disturbed in the hoof until, from its growth, a removal is necessary; and the simplicity and efficiency in the mode of affixing the two plates together, the fastenings being secure, and yet free to work at each step of the horse. The effect of the elasticity in practice is less liability to hard and callous swellings at the joints, freer action of the horse, and a great protection during any tenderness of the feet from any cause.

Those interested in the more humane and efficient shoeing of horses will find a detailed account of Mr. Winder's invention and the mode of its application in *The Foreman Engineer and Draughtsman*, no. 59 for December 1.

THE MECHANISM OF CLIMATIC CHANGE.

MR. AMOS SAWYER contributes, says *Nature*, a short though interesting article to the *Transactions of the Academy of Sciences of St. Louis* on the cause of climatic change in Illinois. During the last twenty years, he says, the climate has been slowly, but surely changing from wet to dry; and although this change has been beneficial from a sanitary point of view, agriculturally considered it has been, and will hereafter prove to be, a great obstacle to the successful cultivation of the soil. The most important agent, in Mr. Sawyer's opinion, is what he calls the aqueous agent. The chemical and mechanical effects of this agency are constantly at work, and the result is plainly visible in the deepening of the channel of all the small streams. At the present time all the prairie land is in cultivation, or used as pasture; the ponds and small lakes have become so filled up that they contain less than half the former amount of water; the stock now consumes the reeds and marsh-grass, exposing the water to the direct rays of the sun, thereby promoting evaporation, so that by midsummer even the mud in their basins has dried to a hard crust, and a change in the temperature during the heated term brings, as a rule, a cool, dry atmosphere instead of rain, as in former years. Mr. Sawyer goes on to describe the large increase in the consumption of water by domestic animals. In this State at the present time there are at least 'three million horses, cattle, and mules, and five million hogs and sheep, and they will consume not less than *seventy million gallons* of water every twenty-four hours—quite a lake of itself.' This, surely, must be a misprint, or American animals are very thirsty beings!

BUILDING SOCIETIES IN AMERICA.

THE *New York Times* observes that the census of 1870 showed that the dwellings in that city gave an average of only one for about fifteen persons, and in nine of the wards 365,000 persons had only one dwelling for every twenty-one persons on an average; but in Philadelphia the average is only six persons to each house, and in the worst wards a little over eight, and since 1870 about 24,000 dwellings have been built in that city, making nearly 135,000 in the whole. In New York, Brooklyn, and Jersey city about 1,700,000 persons are now living in less than 220,000 houses, or in fewer dwellings than the 750,000 inhabitants of Philadelphia. The difference is due mainly to the building associations formed by the working-men themselves in the latter city. These societies date from the year 1831, and it is stated on good authority that more than 70,000 dwellings are now owned by mechanics and men of small means in that city who have become owners in fee through the aid of these associations. Eight years' annual payments of little more than the rent he would have paid as tenant very nearly make a man owner in fee. The money-payments in the societies are estimated to average a million dollars each. The working man is thus forced to save; long experience enables the associations to invest the money well. The amount lent by them on this kind of property is estimated at from forty to sixty million dollars. It is considered that the working-classes of the manufacturing town of Philadelphia are better off, and that they acquire property more rapidly than in any other American city, except, perhaps, San Francisco.

PARAFFINE LAMP EXPLOSIONS.

IN a communication published in the *English Mechanic and World of Science* for December 17, Professor Redwood writes:—'Permit me, sir, before I conclude this long letter, to say a few words about lamp explosions. Your correspondents would lead one to believe that the use of a mineral-oil lamp is fraught with considerable danger. I can only say that in the cases of accidents with lamps which I have had the opportunity of investigating I have always found that when an explosion has been really produced there has been something very faulty about the construction of the lamp, or else the oil burned in it has been such as gave off an inflammable vapour many degrees below 100° Fahr. It sometimes happens with a badly used lamp that the brass cone which fits over the wick-holder becomes partially revolved or twisted round, so that the oblong aperture which should range parallel with the flat sides of the wick is at an angle with these sides. Under these circumstances the flame impinges on the cone, and raises it to a very high temperature, and the heat is conducted to the oil chamber, where it volatilises the lighter hydrocarbons present in the oil. With a good lamp (those entirely constructed of metal are bad) and good oil, I am disposed to regard an explosion of the mixture of oil, vapour, and air as impossible; at any rate, I have never been able to produce it when I have tried. At the time the Petroleum Act was passed, it was, of course, an important question, and Dr. Letheby, in his evidence before the select committee I have already referred to, stated as follows:—"I am not acquainted with any well-founded case of danger arising from the use of oils that are in accordance with the present Act of Parliament. We have made a great number of experiments to ascertain whether oils which flash at 100°, or even a little below 100°, can by any contrivance be exploded in a lamp, and we cannot do it; whether we try by electric sparks, or by a flame of any kind, we cannot fire it; that we have ascertained to be a fact." I could adduce other evidence to the same effect, but my letter is already too long. Of course, I do not deny that the explosion is theoretically possible, but I very much question whether it is practically possible, under fair and ordinary conditions. As Professor Abel, F.R.S., pointed out in his recent lecture at the Royal Institution, there are many so-called lamp explosions which are not explosions. Thus a lamp charged with petroleum oil may be carried incautiously, or accidentally jerked, so that the liquid may be brought into contact with the warmer portions of the lamp near the flame, and a very rapid volatilisation may thereby be caused, resulting in a considerable outburst of flame. In either case a nervous person holding the lamp at the time may drop it in alarm, or the reservoir, if of glass, may be broken by the sudden burst of vapour and the resulting large flame. It is true that this may result in the scattering of the burning fluid, and may thus be very dangerous; but, all the same, it is not an explosion and would not have taken place if ordinary care had been exercised and presence of mind retained.'

NOTICE.

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